



ARCHITECTURAL OVERVIEW OF LIGHT CORPORATION

General Background Information

LIGHT CORPORATION

1. Based in Michigan, Light Corporation is just one company of an innovative and progressive group of companies with capabilities aligned to complement each other. Services and manufacturing capabilities are networked to maximize combined strengths, minimize costs, and reduce development timelines for our customers.
2. Established in 1986, Light Corporation began designing and manufacturing fluorescent task lights and ambient light fixtures for the office furniture industry and has always been committed to providing cost-effective lighting solutions that improve productivity and energy efficiency.
3. Task lighting is the concept of providing the correct amount of light for the task being performed, and when used properly, the general light level in a facility is lowered, creating a softer, more pleasant atmosphere and saving energy.
4. Light Corporation elected to specialize in fluorescent lighting because it is more energy efficient, runs cooler, and has longer lamp life than incandescent lighting. They also have experience working with other light sources and do incorporate halogen, LED, and incandescent into products where appropriate.
5. Effective lighting not only increases productivity and saves energy, it also enhances and brightens the work environment, reduces fatigue and promotes a safe and healthy workplace. And Light Corporation has always worked to develop products that achieve these objectives.
6. With the introduction of the **Semaphore** line of industrial fixtures for high mounting applications, Light Corporation has now taken this core concept beyond the “front office” and successfully incorporated the principles of effective lighting into production, warehousing and any high ceiling areas.
7. **Semaphore** has proven to be immensely popular as a retrofit for existing businesses because of the lower energy and maintenance costs coupled with better productivity in a safer environment, but Light Corporation believes building owners would be better served to simply install Semaphore initially.
8. Light Corporation’s 100,000 sq.ft. facility is registered ISO 9001:2000, which means the products are manufactured to high internal standards and ISO 14001, that ensures those manufacturing processes and company policies are environmentally sound.
9. Light Corporation is a Michigan Clean Corporate Citizen, and even their products are made with an eye toward recyclability.

HIGH-BAY LIGHTING

1. High-bay lighting is used in high-ceiling areas to light surfaces more than 15 feet away. Common high-bay applications include industrial spaces, warehouses, gymnasiums, big box retail, and architectural applications such as restaurants, certain office environments, and lofts.
2. Since the light from standard fluorescent tubes or incandescent bulbs is too diffuse to adequately light a surface at the distance required for high-bay applications, metal halide high-intensity discharge (HID) and high-pressure sodium (HPS) have been the traditional solution.
3. With the development of high-output linear fluorescent lamps, the advantages of fluorescent for high-bay applications became available and only awaited fixture design to capitalize on the lamp technology.
4. Light Corporation's **Semaphore** product line represents the state-of-the-art response to the possibilities inherent in high-output linear fluorescent technology.
5. Light Corporation's just-in-time manufacturing practices and customer-centered philosophy make them one of the very few companies willing and able to do specials, such as incorporating an emergency light into a regular **Semaphore** fixture, or a night light.

SEMAPHORE

1. Light Corporation observed that many of today's factories and warehouses suffer from "cave-like" conditions created by HID, HPS, and old Mercury Vapor lighting systems.
2. Light Corporation took their knowledge and experience from 20 years of lighting office space, as well as their own experience as a manufacturer, and developed the **Semaphore** industrial fixtures that brighten the work environment.
3. **Semaphore** starts with the energy efficient, cool lighting, aspects of high-output linear fluorescent lamps and surrounds them with fixtures designed to maximize their value for high mounting applications.
4. **Semaphore's** advantages fall into four general categories: 1) Product Design, 2) Installation & Maintenance, 3) Illumination, and 4) Energy Saving.

Product Design

5. The **Semaphore** high performance lighting system is constructed with a lightweight corrosion resistant aluminum alloy, featuring fluorescent lamps and an electronic ballast, along with 96% reflectivity specular reflectors that utilize a patent-protected design.
6. Mounting options can include a hook and chain application or Light Corporation's own Slip-Fit cable mounting suspension system which utilizes aircraft cable with grippers that allow the fixture to be leveled by simply pressing up the spring-loaded tip and adjusting the cable.
7. For installations that require protection of the fixture's lamps, a lens assembly or cage option is also available.

Installation & Maintenance

8. **Semaphore's** unique Slip-Fit suspension system utilizes aircraft cable with grippers that allow the fixture to be leveled by simply pressing up the spring-loaded tip and adjusting the cable.
9. **Semaphore's** light weight and Slip-Fit suspension system allows the fixture to be hung in half the time required for standard fluorescent or HID fixtures.
10. There is also a visual advantage to the Slip-Fit system in that it allows long rows of fixtures to be precisely aligned, something that is virtually impossible with conventional hook and chain applications.
11. **Semaphore** is ideal for use in hot environments, because its aluminum construction and proprietary design allows more air penetration and movement than alternative products. This keeps the ballast cool and prolongs its life.
12. When the time comes for ballast replacement, it is substantially easier to get to a **Semaphore** ballast, because of its exoskeleton design, than to access an HID high-bay ballast. It is also easier than for other fluorescent fixtures.
13. There is another maintenance issue associated with metal halide that is not present with **Semaphore**. The metal halide fixture goes out completely and without warning at the end of its usable life, dictating an immediate, unscheduled maintenance response.
14. **Semaphore's** Warranty is 5 years on fixtures, 3 years on lamps, and 5 years on ballasts.

Illumination

15. **Semaphore** fixtures deliver as much light as metal halide high intensity discharge (HID) high-bay, at approximately the same initial cost, providing even lighting that has fewer shadows or "spot-lighting."
16. On the basis of industry-accepted usable life cycles, **Semaphore's** 24,000 hours is 20% longer than HID's 20,000 hours, however these figures only tell part of the story.
17. Lamp Depreciation graphs show that HID illumination quickly drops off—losing 30% of its illumination at 75% of its usable life, 40% at the halfway mark, and almost 50% by the time it has only 25% more of its usable life remaining. Obviously illumination is inconsistent in areas served by metal halide lamps.
18. The same Lamp Depreciation graph also depicts the stability and continuity of the T8 and T5 fluorescent fixtures, which never lose more than 6% of their illumination capacity throughout their entire usable life.
19. The Color Rendering Index (CRI) provides a standard for lamping compared to natural daylight, which is rated at 100. All **Semaphore** products are rated at 85, compared with 65-70 for standard HID. This can be important for practical reading of color codes for example, as well as for aesthetic reasons.
20. Unlike HID, which can take 15 minutes to reach full brightness, all **Semaphore** products are instantly on.

Energy Saving

21. **Semaphore** fixtures are rated at 92% efficiency and have advantages that can be used for LEED credits. Comparable ratings for metal halide HID and high pressure sodium are only at the 65% efficiency levels.
22. Using **Semaphore** instead of HID high bays will typically reduce the energy cost for lighting by more than 50%.
23. Utilities often limit the total amount of power available to a building. A manufacturer in Pullman, MI needed to add 3 welding machines that required more power than the utility would allow. Switching from HID high-bays to **Semaphore** reduced the energy consumption sufficiently to allow the welders to operate and ultimately paid for the new equipment in energy savings.
24. Unlike HID fixtures, **Semaphore's** fluorescent based technology has the capacity to be used with dimmers and to accept occupancy sensors, further increasing the energy savings.
25. Depending on the local utilities policies, there is also the possibility of obtaining rebates based on the significant energy reduction achieved when **Semaphore** is used instead of HID high-bays.

RESOURCES

1. Light Corporation has an extremely helpful **Semaphore** CD available with 6 categories of information :
 - a. Environmental – reports on Fluorescent lamps and High Bay lighting
 - b. Knowledge – 12 reports on a variety of subjects
 - c. Report Tools – includes actual audit examples
 - d. Warranty details – for fixtures as well as the lamps & ballasts
 - e. IES – files with photometrics reported by independent testing laboratories.
 - f. Product Specific – 7 reports on a variety of subjects+ main brochure & Semaphore cut sheets
2. Light Corporation has knowledgeable staff who can assist on a project-specific basis to make **Semaphore** fixture recommendations, provide a zoned layout, do a specific photometric study, give an energy savings estimate, or audit an existing layout.

OVERALL COMPETITIVE EDGE

Although the initial cost of **Semaphore** and HID high-bays are similar, **Semaphore's** installation costs and energy usage are 50% less, yet the illumination is comparable initially and superior over time.

MARKETING DATA

- A. Michigan based Light Corporation's many years of experience using fluorescent lighting for task lighting fixtures led them to develop the **Semaphore** line for high mount applications, as an energy saving and better performing alternative to the current industry standard, HID high-bays.
- B. **Semaphore** is constructed with a lightweight corrosion resistant aluminum alloy, along with 96% reflectivity specular reflectors, utilizing a proprietary design that allows for more air penetration and movement, which prolongs the life of the ballast.
- C. A **Semaphore** fixture has about the same initial cost as an HID high-bay and delivers similar illumination initially. But **Semaphore** loses only 6% of its illumination capacity over the life of the lamp, whereas the HID lamp will have lost almost 40% halfway through its usable life.
- D. HID lamps take about 15 minutes to reach full brightness, but **Semaphore's** fluorescent lamps are instant on, and their color rendering index is twice as good as HID, which can be important for practical reading of color codes for example, as well as for aesthetic reasons.
- E. Using **Semaphore** instead of HID high-bays will typically reduce energy costs by more than 50%, plus **Semaphore** is able to accommodate dimmers and occupancy sensors, further increasing the energy savings.
- F. **Semaphore's** light weight and Slip-Fit suspension system allows the fixture to be hung in half the time required for standard fluorescent or HID fixtures, and Slip-Fit also allows long rows of fixtures to be precisely aligned, something virtually impossible with conventional hook and chain applications.