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**Nine Crucial
Questions to Ask
Before Retrofitting
Your Industrial
Facility with LED
Lighting**



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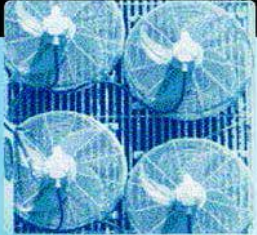
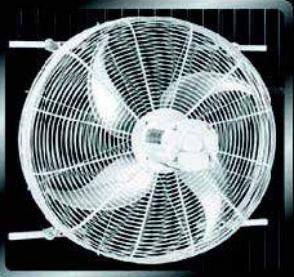
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Megger Donates 20 Digital Multimeters to Johnson County High School Seniors for Graduation

Students in the Electrical, Mechanical & Plumbing Systems class benefit from the donation

Pictured are Maretta Ferguson and Andrew Whitaker, JCHS Seniors and recipients of the AVO830.

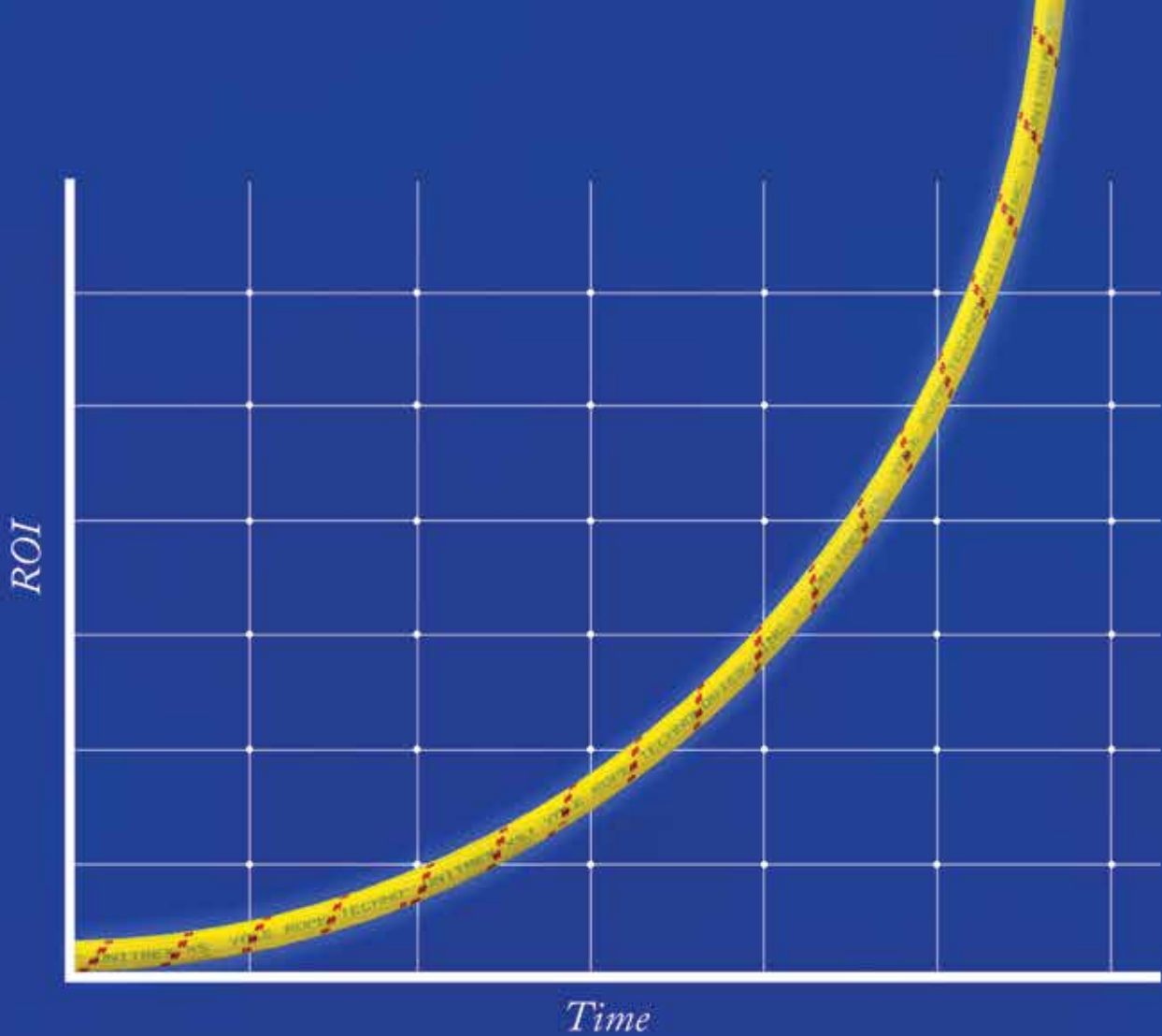


Megger recently donated 20 digital multimeters to 20 graduating high school seniors in the Electrical, Mechanical and Plumbing Systems class at Johnson County High School (JCHS) located in Mountain City, Tennessee. The AVO830 digital Trms multimeter offers a voltage range up to 1000V Trms and is designed to reduce the need for additional auxiliary instrumentation, like phase rotation detectors and non-contact voltage wands.

JCHS offers its students an excellent construction program. Through this program, led by instructor Lee Cole, students are given the opportunity to build a house from start-to-finish, sell it and then use the money from the sale of the home to start the next house project. During the Fall 2019 home build, Lee contacted Megger about having them donate insulation testers to the program. Megger obliged by giving them four insulation testers, as well as an MTR105 motor tester, along with education materials for the classroom, including Megger's ground and insulation testing guide booklets - Getting Down to Earth and A Stitch in Time. Megger was so moved by the school's commitment to its students and the wonderful projects that they do, that they decided to donate an AVO830 to 20 graduating seniors in the program.

David S. Danner, director of US distribution for Megger, who has been working with JCHS said, "We are proud to donate 20 AVO830 multimeters to these deserving students. This will help them get started on the right foot as they leave high school and embark on their next journey."

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well-built, high reliability multimeter is suitable for a wide range of applications, including maintenance of electrical applications and equipment, white goods service and electrical utilities.

Lee Cole, Construction teacher at JCHS, said, "I am tickled to death that Megger donated these multimeters to our seniors. They have outfitted these kids with the most expensive piece of equipment that they will need to start out in the workforce. They have taken away the obstacle of that expense for these students and have sent them well on their way, prepared to work with the very best equipment on the market from day one on the job."

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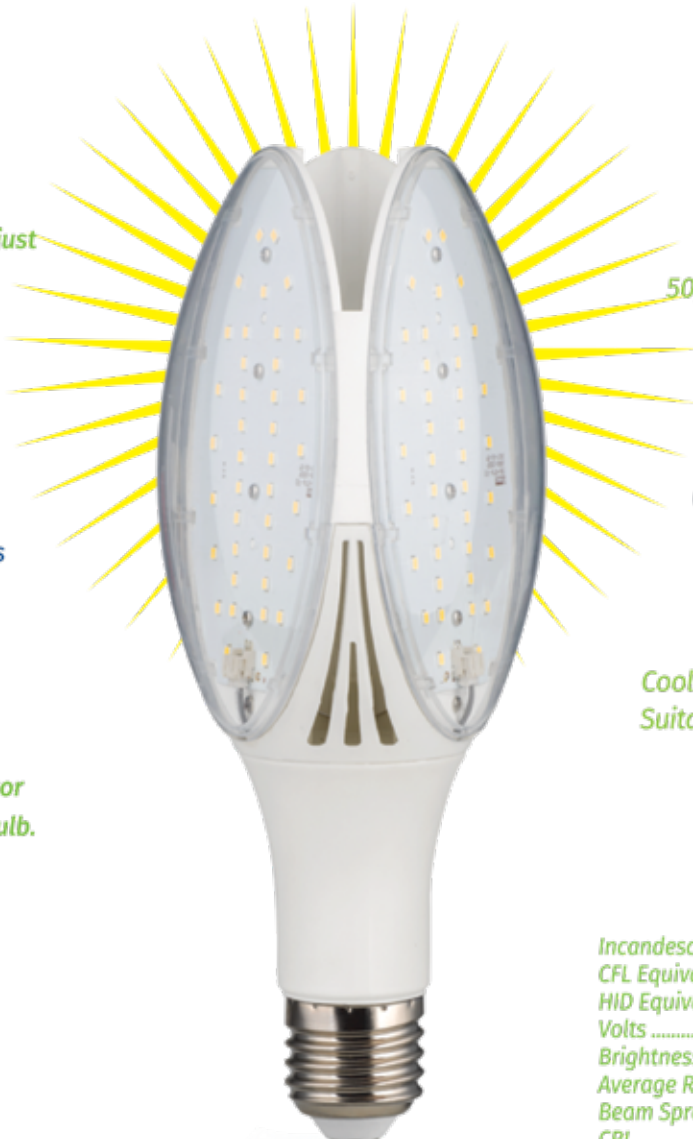
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<i>Average Rated Hours</i>	<i>..... 50,000</i>
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Nine Crucial Questions to Ask Before Retrofitting Your Industrial Facility with LED Lighting



Emerson explains why converting from traditional lighting sources to LED improves safety, productivity and long-term financial performance

When facilities are considering converting from traditional lighting sources to LEDs, getting buy-in from management before beginning the retrofit is a key step to assuring a successful project. With today's LED solutions offering some of the most energy efficient and reliable lighting technologies available, making a compelling retrofit case with your manager should be a simple process, once you have the facts.

Q: What are some ways LED lighting increases safety?

Sufficiently bright, uniform lighting is critical for workers to perform their jobs safely and efficiently. However, in many facilities poor-quality lighting exists, with plant personnel focusing on illumination only when lamps are not working. According to a recent Bureau of Labor Statistics report, fatal work injuries from falls, slips, or trips continued a general upward trend that began in 2011, increasing 6% to 849 in 2016 and 25% overall since 2011. The long lifetime of LEDs can significantly cut back on maintenance, and less maintenance means less workers climbing ladders or operating mobile lifts to access

luminaires for servicing and repair. Because they are instant on, no wait time is required to restore light after a power loss or surge event. LEDs also offer better color rendering. And well-designed optics lead to evenly-distributed light, and increased uniformity in hard to illuminate areas; improved light quality leads to safer environments for everyone.

Q: What kind of labor savings is realized by upgrading to LEDs?

A facility that runs twenty-four hours a day, seven days a week requires 8,760 hours of illumination per year! When trying to meet this number of needed illumination hours — depending on luminaire run time, ambient temperature, and make/model — ballasts may need to be changed every two years or more. High Intensity Discharge (HID) lamps (e.g. Metal Halide, Pulse Start Metal Halide, Mercury Vapor, High Pressure Sodium) can last 10,000 to 24,000 hours. Fluorescent typically lasts 20,000. Incandescent lamps usually need to be changed every other month.

The time it takes to change a lamp can range from 15 minutes to an hour, depending on the location and height of the luminaire. And circuits need to be de-energized before removing dead ballasts from the interior of the luminaire. Additionally, in many locations or applications, workers need ladders or mobile lifts to reach fixtures. Alternatively, LED luminaire lifetimes are reaching 100,000+ hours. This means LED luminaires can last 10 years or more, depending on the ambient temperature of the installation location. By upgrading to LEDs, maintenance personnel no longer need to change lamps and ballasts.

To further explore potential maintenance, energy, and environmental savings accomplished by a LED retrofit, please check out the Appleton Lighting Retrofit Calculator. This interactive tool can help your facility visualize savings specific to your location.

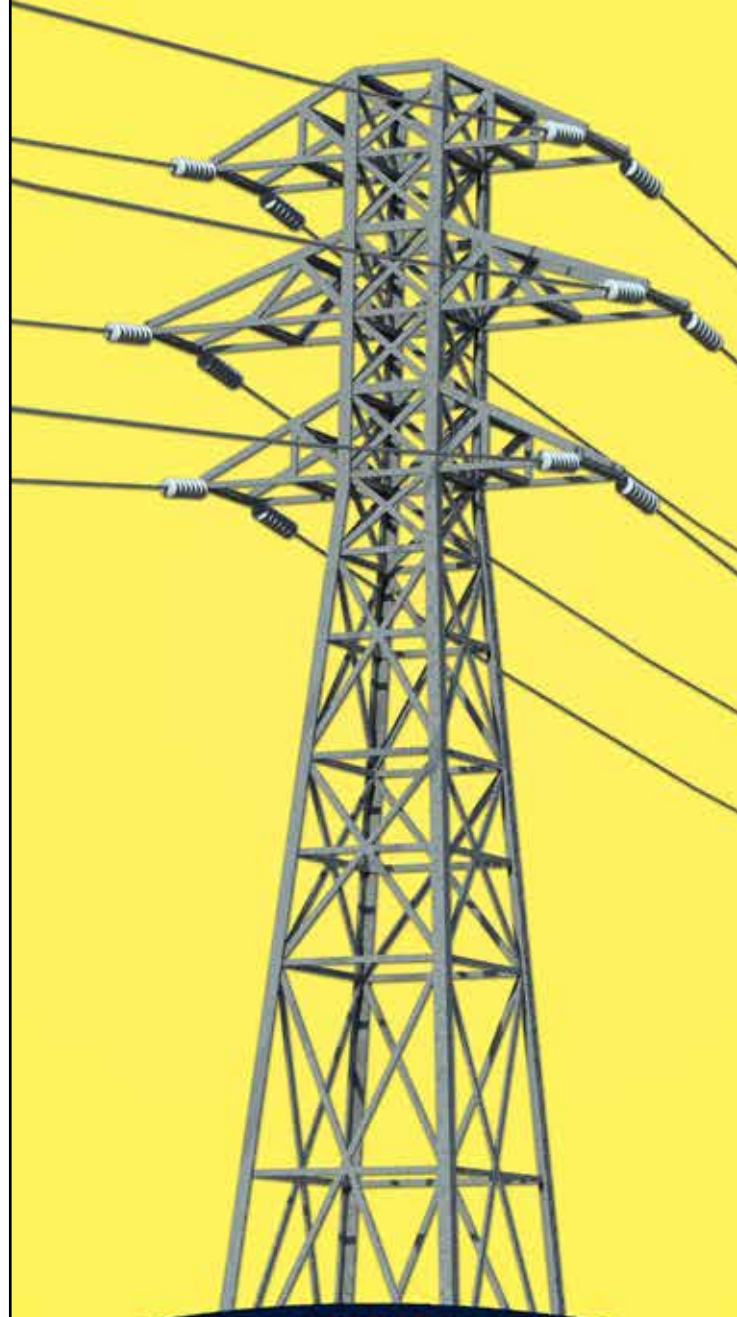
Q: How much energy can retrofitting a facility's lighting save?

LEDs reduce energy consumption by up to 70% for HIDs, and 45% for fluorescent. An 85-watt induction luminaire consumes 50% more energy than the LED alternative with the same lumen output.

Q: How easy is it to replace traditional light sources with LED luminaires?

Retrofitting an existing HID fixture could be as easy as replacing the old ballast body with a new driver housing. By utilizing existing mounting hoods, there's no

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need to reroute costly conduit systems or pull new wires. A manufacturer that offers a true one-for-one retrofit solution will design LED fixtures to mate or adapt to existing mounting means.

Q: How do high incidents of surge events impact LED solutions?

Industry experts estimate that power surges cost businesses \$26 billion annually in lost time and equipment repairs and replacements.* The U.S. Department of Energy (DOE) Municipal Solid State Street Lighting Consortium (MSSSLC) has developed a model specification detailing performance and surge suppression requirements for two levels, location category C Low and C High. Category C High applies to service entrance, the more severe environment, and specifies 10kV of protection. Category C Low dictates 6kV of protection. A quality LED manufacturer will offer a minimum of 6kV of surge protection in LED luminaires. *Source: Insurance Institute for Business and Home Safety

Q: How do LED luminaires perform in extreme environments?

LEDs resist vibration and shock. Additionally, many manufactures offer both instant-on and cold-start at 40°C (104° F) with no degradation of lumen output capabilities. Advances in thermal simulation and design have resulted in luminaires that can operate in environments up to 65°C (149° F) without any decrease in light output.

Q: What about LED luminaires for harsh industrial or hazardous locations?

Luminaires installed in harsh industrial areas should carry environmental certifications such as: NEMA Type 3R, 4, 4X, IP66/IP67, suitable for use in wet locations, and marine outside type (salt water). Common harsh industrial areas include areas where dust, water, dirt and rough usage are a problem such as power generation plants, foundries, water and sewage treatment plants, steel and other metal processing facilities, pulp and paper mills, and other types of processing plants.

Luminaires installed in hazardous locations must be listed and certified for installation in the specific area (example: Class I, Division 2, Groups A, B, C, D). Hazardous locations are considered classified areas according to the National Electrical Code, Canadian Electrical Code, IECEx/ATEX or other standard. Common hazardous locations include oil refineries, onshore and offshore oil and gas drilling rigs, pipe-

lines, chemical plants, and grain or coal processing facilities.

Q: How can facilities ensure that the LED luminaires they use for retrofits will qualify for incentives or rebates?

Multiple energy savings incentive programs are developed by governments and utilities all over the world, with the Database of State Incentives for Renewables & Efficiency® (DSIRE®) being a great tool to find incentives in the United States. Most agencies require that a luminaire appear on the Designlights™ Consortium's Qualified Products List (DLC QPL) to be considered eligible for state and utility energy efficiency program incentives.

Q: What about the equivalences between traditional HID and LED solutions?

Unfortunately, no universal standard exists today to convert traditional HID measurements to their LED counterparts. However, when trying to determine the appropriate LED equivalent light fixture, there are a few key considerations to keep in mind: First, LEDs are directional, and can be focused to provide light just where you need it. This is different from traditional HID lamps that provide uncontrolled light in every direction. This means that with LEDs you can achieve your required light levels with much fewer lumens and watts. As a rule of thumb, an LED equivalent luminaire will only require about 1/3 as many lumens as its HID lamp predecessor. Second, spatial distribution is an important factor when determining if an LED "equivalent" fixture will do the same job. Early LED products didn't offer sufficient spread to cover the spans of existing lighting infrastructure and users were frustrated by dark shadows and poor uniformity. Choosing the right LED design can make a big difference in achieving comfortable, uniform lighting. Third, LEDs will generally appear brighter than you think they are going to. This is because the blue spectral component in LEDs causes us to perceive the light output as brighter than another light source with the same illuminance. This phenomenon is especially pronounced in outdoor lighting applications.

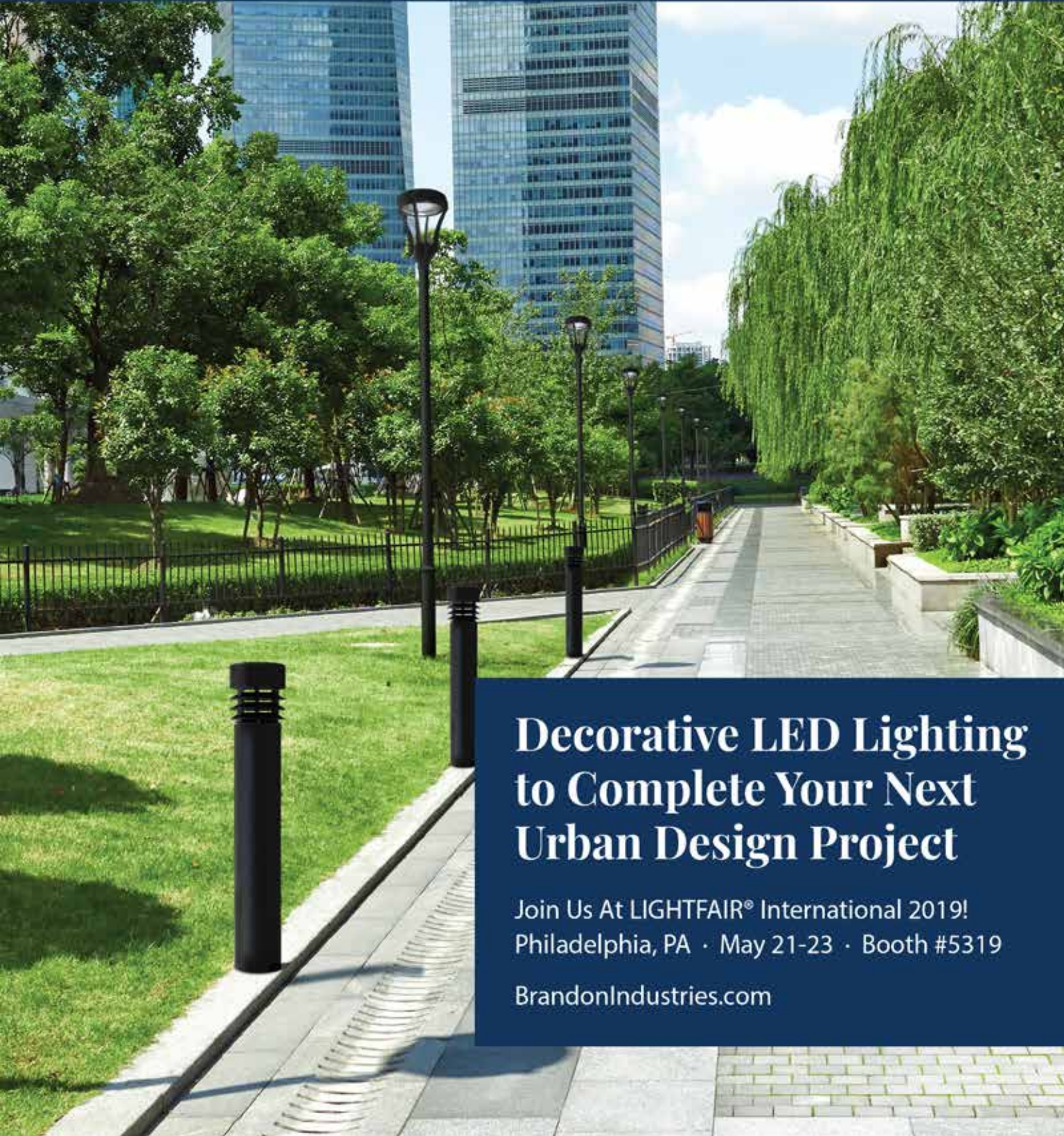
Always remember to request a sample prior to settling on a fixture design. Nothing compares to seeing a fixture hung in the actual application, and most manufacturers have a sample program to try out a fixture prior to making a large investment.

Learn more at <https://www.emerson.com/en-us/automation/electrical-component-lighting/lighting>



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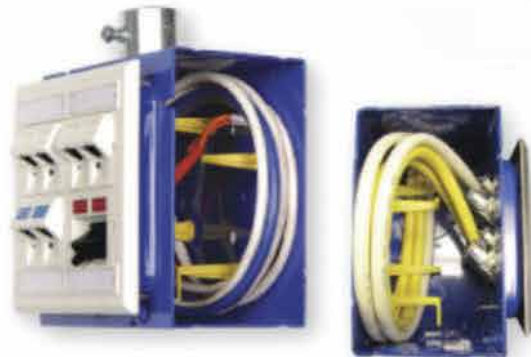
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