LED
INNOVATION CENTER
Cooper’s 60,000 square foot Innovation Center opened its doors in 2009. The multi-million dollar facility is home to the research, development, design, validation, and manufacturing of proprietary LED and other advanced lighting technologies. Teams of highly skilled Mechanical, Electrical, Thermal, Optical, and Reliability Engineers work hand in hand with Industrial Designers, Lab Technicians, and Manufacturing personnel to accelerate the development and commercialization of relevant industry-leading LED solutions.
Cooper has made significant investments in talented personnel, state-of-the-art equipment, and in the latest analytical and design software. Our world-class Innovation Center teams execute multiple LED design and performance assessments including visual renderings, thermal simulations, electrical analysis, and optical ray-tracing. Our stringent product development process ensures a highly reliable product every time.
Our highly qualified lab and research development teams take great pride in their active involvement in creating and driving industry standards. Cooper Lighting’s Certified Test Laboratory conducts extensive testing of electrical, optical, and thermal properties for robustness in application and intended performance over rated life. The testing performed is capable of validating products to industry standards such as LM-79, LM-80, ENERGY-STAR® and UL.
Reliability is one of the most important elements of LED lighting. Cooper’s Reliability and Thermal Laboratory is vital to ensure our LED luminaires meet their stated performance over the lifetime of the product. Our experts use the most advanced environmental and thermal mapping test equipment along with a rigorous testing protocol and statistical analysis tools to ensure long-term performance of LED components, systems, and finished luminaires.
Manufacturing and assembly is a critical and final step in the LED product development process. By involving the Innovation Center operations team throughout the design process utilizing tools like Production Failure Modes and Effects Analysis (PFMEA), we have optimized our manufacturing process and mitigated risk of premature failure.

Our state-of-the-art Pilot Production area incorporates modular and transferable cell construction, a temperature and humidity controlled environment, and ESD protection for a well manufactured fixture each and every time.

Our products are further evaluated and qualified through 100% end-of-line testing for power (wattage), light output, and color temperature. Finally, our products are bar coded and the production data is captured in a manufacturing database to provide system and assembly level traceability and quality control.
The Research and Development Prototyping area houses world class rapid prototype equipment and lean manufacturing work-cell development capabilities to reliably deploy new advanced lighting technologies. The modernized rapid prototyping lab includes the latest milling and Computer Numeric Control (CNC) equipment and an advanced quality lab for layout and validation. In addition, operations such as painting, welding, and fused deposition modeling (FDM) are performed.
LED PRODUCT OFFERING

INDOOR, OUTDOOR AND SPECIALTY LIGHTING SOLUTIONS

It’s time to redefine expectations and embrace a new generation of outdoor and indoor luminaires that allow for meaningful energy reductions and improved maintenance cycles. Cooper’s patented and patent pending technologies catapult LED into the mainstream by providing leading performance, energy, maintenance, and environmental benefits.

Cooper’s comprehensive capabilities in LED design, thermal modeling, accelerated life and reliability testing, photometric measurement, rapid prototyping, and manufacturing is unmatched amongst luminaire manufacturers. The Innovation Center demonstrates our long term commitment to this transcending light source and other advanced lighting technologies. Cooper Industries has been innovating for over 175 years, and we continue this tradition with our ongoing dedication to developing world-class, energy efficient lighting and controls technologies.
Cooper Lighting offers courses and workshops in LED technology and architectural lighting controls. Participants gain a working understanding of LEDs and methods for integrating them into today’s lighting system design. Courses will introduce typical real-world applications of LEDs as both the residential and commercial environments are reviewed. Cooper Lighting is one of the first luminaire manufacturers in the lighting industry to offer such an extensive training program in LED technology.
WHAT IS AN LED?
A light emitting diode (LED) is a semiconductor device that converts electricity into light. This solid-state light (SSL) source operates through electron-hole recombination. Very specific wavelengths or colors of light can be generated with the proper choice of materials and structure within an LED device. LED manufacturers have made immense strides in improving the LED performance over the last decade, bringing this technology to the point that energy-conscious customers can now capitalize on the high efficiency and longevity of this technology for general lighting applications.

ARE LEDS READY FOR GENERAL LIGHTING?
Absolutely! There are primarily three metrics that are used to gauge the applicability of the LED technology to an application: flux (lumens), luminous efficacy (Lm/W) and cost efficacy ($/Lm). Each of these properties has improved significantly for LED devices over the last few years, making them viable for use in many general lighting applications today.

WHAT IS AN LED DRIVER?
Because an LED is inherently a low voltage-driven device, a power supply is required to “condition” the line voltage input to lower LED operational voltages. This is similar to the function performed by an HID or Fluorescent ballast, but is typically referred to as an “LED Driver”.

HOW DOES THE LIFE DEFINITION COMPARE TO TRADITIONAL LIGHT SOURCES?
For most lamp types, rated lamp life is the length of time of a statistically large sample between first use and the point when 50% of the lamps have died. For an LED source, due to the prolonged time over which the device emits light, a lifetime definition is based on lumen maintenance. This definition refers to LX, where L is the time required for the light output from the source to reach X% of its initial value. Depending upon the LED lighting application, X is trending to either 50% or 70%.

WHAT ARE LM-79 AND LM-80?
LM-79 was developed by the IES Testing Procedures committee at the request of the U.S. Department of Energy. While other standards for photometric measurements of lighting sources and luminaires are available, these standards are separated for measurement of lamps and luminaires. Since current SSL products are in the forms of luminaires or lamps, and LED sources in the luminaires are not easily separated as replaceable lamps, these standards cannot be applied directly to SSL products. LM-79 is the approved method for performing reproducible measurements of total luminous flux, electrical power, luminous intensity distribution, and chromaticity.

LM-80 was developed by the IES Testing Procedures committee at the request of the U.S. Department of Energy. LM-80 defines the approved method for measurement of lumen maintenance of inorganic LED-based packages, arrays, and modules. It describes the procedures by which LED sources can be operated under controlled conditions to obtain optimally comparable data on changes in light output during the life of the product. It does not provide guidance or make any recommendation regarding predictive estimations or extrapolations for lumen maintenance beyond the limits of the lumen maintenance determined from actual measurements.

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