

ASSIST Alliance for Solid-State Illumination Systems & Technologies

More than 15 years of industry partnership to advance research, education, and demonstration for the broad adoption of SSL

Solid-state lighting—the white LED in particular—has advanced to become the most promising light source because of its ability to save energy and reduce environmental pollutants while maximizing the benefits of custom, quality lighting. The trajectory for LED lighting has moved sharply upward in the last decade, away from small indicators and toward general illumination. This movement could not have been achieved without industry collaboration.

Since 2002, the Alliance for Solid-State Illumination Systems and Technologies (ASSIST) has brought together a global group of lighting manufacturers, academia, public benefit organizations, and government to become an international resource for research, education, and demonstration of solid-state lighting.

About ASSIST

At the beginning of the 21st century, the lighting and semiconductor industries lacked understanding of each other's respective terminology, definitions, and performance requirements. To help address this concern, ASSIST was established by the Lighting Research Center (LRC) at Rensselaer Polytechnic Institute as a collaboration among researchers, manufacturers, public benefit and government organizations to find solutions to the many technical and market challenges facing solid-state lighting. ASSIST activities have led to new metrics and test methods that have informed the standards-setting process; new evaluation methods for lighting applications and LED technology; demonstrations that have shown the potential for LED lighting; and educational programs for the community interested in LED lighting—all helping to nurture this promising technology.

In the last decade, those with a stake in LED lighting have committed their time and resources to ASSIST because of the group's focus on tackling industry issues and concerns; the collaborative model employed in which members meet to formulate questions and guide research activities; and the benefits from drawing on the LRC's holistic knowledge of lighting technologies, design, application, vision science, and human factors. The industry also benefits from the LRC's educational mission to prepare students as future leaders in lighting.

ASSIST's mission is to enable the broad adoption of solid-state lighting by providing factual information based on applied research and by visualizing future applications. On behalf of ASSIST, the LRC conducts research, demonstration, and education. Beyond technical research, ASSIST has fostered discussions between traditional luminaire and LED manufacturers. Through this work, ASSIST is helping LED technology to gain widespread use in lighting applications that can benefit from this rapidly advancing light source.



Lighting
Research Center

ASSIST Members: Amerlux; Current, Powered by GE; Finelite; Hubbell Lighting; New York State Energy Research and Development Authority; OSRAM; Seoul Semiconductor; U.S. Environmental Protection Agency.

Research Translates to Quality Products and Applications

ASSIST's research follows the complete path from definition to metric to data and validation of design, enabling the selection of quality products. As a first step, ASSIST devotes much of its efforts to **defining performance**, which had been a missing piece in the early years of the LED lighting industry. ASSIST's first industry recommendation, released in 2005, defined the "useful" life of LED lighting at L70 and provided a method for estimating useful life, which eventually became the basis for the IES LM-80 standard.

Definitions then become the foundation for research to develop test procedures, metrics and other tools designed to more **realistically characterize performance and energy efficiency**. The first aspect of this research is specific to light source performance. ASSIST has developed definitions and calculation tools to evaluate light source flicker, discomfort glare, dimming, color rendering capability, and mesopic efficiency. The second aspect involves the lighting application. No technology can succeed if its performance does not meet expectations, and judgments are almost exclusively based on the performance of a lighting system within a given application. ASSIST has led the development of metrics that redefine the energy efficiency of numerous applications: under-cabinet, directional, decorative, parking lots, roadways, and freezer cases. These metrics work for all lighting technologies because they emphasize performance based on the application's typical requirements and environment, rather than traditional metrics of luminous efficacy and luminaire efficacy. These calculation tools, test procedures, and application metrics are published in a series called *ASSIST recommends*.



Demonstration of Innovative Uses for LEDs

On behalf of ASSIST, the LRC has demonstrated innovative uses of LED lighting to showcase the technology's unique benefits and potential. These have included concepts that integrate LED lighting with building infrastructure and interior design, rather than implemented later as an add-on or retrofit. These concepts bring together multiple industries to improve lighting quality.

Education and Training Seminars

The LRC was the first to offer an independent, research-based university workshop that elevates participants' knowledge of LED lighting technology and best practices for application. The biannual LED Lighting Institute, sponsored by ASSIST, along with international seminars and conferences, have been educating lighting designers, architects, engineers, and other professionals from around the globe for more than 15 years. Beyond the lighting community, ASSIST has published application guides and LED product selection how-to's geared toward retail consumers and homeowners.

About the Lighting Research Center

Rensselaer's Lighting Research Center is the world's leading university-based research and educational institution devoted to lighting. Based in Troy, New York, the LRC's staff of researchers, designers, and educators is working to advance the effective use of lighting to create a legacy of positive change for society and the environment. The Solid-State Lighting Program, established in 2000, leads the LRC's LED lighting research and testing projects. LRC facilities include a fully equipped photometry laboratory, climate controlled lamp and electrical testing laboratories, and human factors research space.

For More Information

www.lrc.rpi.edu/assist

N. Narendran, Ph.D., Director of Research
(518) 687-7100 or narenn2@rpi.edu

