



Bridgestone Achieves Perfect Display on Ice

Whether fans are watching the Nashville Predators game live or on HDTV, CCT tunable lighting in the Bridgestone Arena delivers an unmatched viewing experience.

Challenge

To replace a metal halide lighting system with an LED based system that can provide the light quality needed for a variety of events including the 61st NHL All-Star game at the Bridgestone Arena in Nashville.

Solution

247 metal halide fixtures were replaced with 120 Ephesus Arena Pro fixtures using LUXEON LEDs that provide instant on/off performance, 3500-6500K tunable color temperature, 10 year guaranteed light levels, and full HDTV compatibility.

Results and Benefits

Light quality was optimized for HDTV capture and improved visibility while electricity usage dropped by more than 80%, maintenance was reduced significantly, and the project is set to achieve a 2.5 year return on investment. Installation of the LED fixtures was performed completely during game off-hours, making it a seamless process to fans.



Arena Pro by Eaton's Ephesus Lighting

Challenge

The Bridgestone Arena is home to the Nashville Predators hockey team, but it also hosts a variety of other events such as Monster Jam truck shows, NCAA games, stand-up comedy and musical performances. In the past, general lighting needs were met by the metal halide lights installed some 30 years ago when the arena was built. Metal halide lights are inexpensive, but they require annual lamp replacement, frequent cleaning, and provide poor lighting for HDTV cameras. Furthermore, the metal halide lighting at the Bridgestone Arena did not have a shutter system, so light control during hockey warm-up and intermission periods was particularly tricky. With the advent of LED technology and in particular, CCT tunable technology, the owners and facility manager of Bridgestone began exploring LED options.

The lighting requirement for the stadium went beyond specifications such as high color rendering and different color temperatures – 5600K for hockey, 4200K for basketball and 3500K for performances. With HDTV and 4k/8k pixel displays, there's now a need for high color fidelity, specifically stadium lights tuned for a high Television Lighting Consistency Index (TLCI) score. With a higher TLCI, the HD image sensor in the camera captures a higher fidelity image. The end result is improved visibility when it comes to a small hockey puck traveling rapidly on ice, as well as truer color perception due to the spectrum delivered by the LEDs. Finally, there is a desire to focus more light on the ice rink, while limiting light spill to the surrounding stadium seats.

Solution

Lumileds worked directly with the lighting manufacturer, Eaton's Ephesus Lighting, to provide the sports lighting solution for the Bridgestone Arena. The approach by Ephesus first was to consult with the camera crews working for the top broadcasting networks in sports to determine the exact lighting specifications required for HDTV capture, panning and slow motion play. While the trend by some lighting manufacturers has been to simply increase the lumen output levels to achieve better visibility, the folly of too many lumens was evident at another stadium lit by a



The Ephesus Arena Pro fixtures using LUXEON LEDs (see left) deliver high color fidelity, color consistency and light uniformity. Compared to the old metal halide lighting (see right), the Ephesus Arena Pro fixtures also demonstrate a much better viewing experience for spectators as well as HDTV broadcast.

competitor's LEDs, where players actually complained that the light was so bright that it was interfering with their ability to play. In contrast, Ephesus and Lumileds engineered the proper spectrum to provide the best quality of light.

Using LUXEON LEDs from Lumileds in Ephesus Arena Pro fixtures, the arena now delivers high color fidelity and is able to maintain constant light output while tuning to color temperatures between 3500K and 6500K. The LED lighting provides instant ON and instant OFF, key functionality for all games and shows. These ultrahigh efficacy LEDs deliver high flux levels in directional applications, that when combined with precise optical control in Arena Pro fixtures, eliminate the problem of shadows caused by scoreboards and other obstructions in the stadium. The result is improved visibility while keeping the light level at the playing surface constant at 200 footcandles. The light can be tuned for CCT, while delivering high color fidelity, color consistency and light uniformity. LUXEON LEDs also perfectly balance efficiency and system cost, speeding the return on investment of the arena's 120 Arena Pro fixtures.

“Our lighting consultants worked with the leading sports broadcast networks to ensure that current and evolving requirements for HDTV would be met by our CCT tunable technology.”

— Joe Casper, Chief Technology Officer
Ephesus Lighting Inc.

Results and Benefits

The benefits of the LED solution over metal halide are extensive – from vastly longer lifetime to excellent energy efficiency and dramatically reduced maintenance cost. The color spectrum of the LUXEON LEDs in the Arena Pro fixture caters to the needs of HDTV broadcasters as well as spectators. Feedback from camera crews and spectators indicates the Arena Pro system enables greatly improved visibility at a variety of events. The Arena Pro fixtures provide shadow-free illumination on the ice rink while limiting light spill to the arena seats. Warmer color temperatures and lower light levels can now be accomplished for events such as Casino Night, and stark differences in light levels can be achieved, for instance, between player tables and bar areas.

Metal halide lamps tend to fade as they age, providing uneven brightness and color quality. In the arena, they were typically replaced annually. The Ephesus fixtures with LUXEON LEDs carry a five year warranty and are expected to last 15 years or longer. The fixtures feature excellent flux and color consistency from one end of the arena to the other, freeing up technician's time normally spent on balancing and color correcting the light. Interestingly, the metal halide lamps, despite their distance from the playing surface, also generated enough radiative heat to not only increase the refrigeration load on the ice, but also interfere with the ice recrystallization process during Zamboni resurfacing. Players have commented on the improved consistency and quality of the ice after the transition to LED lighting.

The Arena Pro fixtures provide a very robust solution with mounting brackets that ensure the lights will not move once installed. With the LED fixtures, the overall weight on the rafters is also drastically reduced. This burden on the rafters is significant because performance acts bring and install their own lights each time, which increases the overall load.

The metal halide lighting solution weighed 29,500 lbs., which has been reduced to 9,500 lbs. with the new LED system. By eliminating over ten tons of weight from the roof beams, the engineers are allowing for additional light and sound equipment to be installed by these outside shows.

The sealed Arena Pro fixtures also require less frequent cleaning than metal halides, which is an issue following events such as Monster Jam truck shows. The cleaning process was extensive with the show dirt having to be wiped off each surface of the MH lamp housings and reflectors, and now only requires a simple wipe down of the outer LED lens plate. The Bridgestone Arena is also positioned to attract a greater variety of shows now that it can accommodate instant on and off of the lighting system, CCT changes and programmed light schemes via DMX control.

The return on investment for the LED installation was 2.5 years including energy savings, maintenance savings and state rebates. Electrical lighting load dropped from 415,000W to 89,000W and energy consumption dropped from 1.1 million kilowatt hours to 200,000 kilowatt hours—a savings of more than 80%. This savings is greater than the total annual electrical consumption of over 85 homes and removes the equivalent amount of greenhouse gases as 1.5 million miles driven by an average car. All of this was accomplished while significantly improving light quality, light levels and uniformity on the playing surface.

Given all these benefits, the arena owners are very pleased with the lighting upgrade. However, the most telling result has been the comments from hockey fans, people who have marveled at the light quality in the arena and claim they have never seen a better show.

“We compared several lighting manufacturers, but when it came right down to it, only Ephesus could achieve the outstanding light quality, ambitious turnaround time and installation goals that we set for them.”

— Tim Freidenberger, Facility Manager
Bridgestone Arena

About Eaton’s Ephesus Lighting

Eaton’s Ephesus Lighting business manufactures high-output LED lighting solutions for challenging applications in the industrial and sporting markets. The business is focused on innovating advanced LED solutions that will enrich and illuminate the world, by creating brighter, more vibrant and more sustainable environments. For more information, visit www.ephesuslighting.com, follow us on Twitter @EphesusLighting or contact us at 315-579- 2873 or info@ephesuslighting.com.

About Lumileds

Lumileds is the global leader in light engine technology. The company develops, manufactures and distributes groundbreaking LEDs and automotive lighting products that shatter the status quo and help customers gain and maintain a competitive edge. With a rich history of industry “firsts,” Lumileds is uniquely positioned to deliver lighting advancements well into the future by maintaining an unwavering focus on quality, innovation and reliability.

To learn more about our portfolio of light engines visit www.lumileds.com.

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For a video showing the Bridgestone Arena’s lighting transformation, see <https://youtu.be/2krVlhbg3zo>



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