

A New Kind of Auto Lighting

By: Sharon Stancavage

The creation of a new unit for the North American International Auto Show



The North American International Auto show, held at Cobo Hall in Detroit each January, is known for premiering North America's best and, in some cases, most energy-efficient automobiles. This year was no exception. The Chevy Volt, General Motors' premier electric vehicle, garnered quite a bit of attention from the media on the show floor.

However, the Volt wasn't the only ecologically friendly innovation in Cobo. Illuminating the new car was the newest in green LED technology, the AutoLED luminaire. "It is a purpose-built fixture," explains Rick O'Neill, president of Light Source, of Milford, Michigan. At its most basic, that purpose is to illuminate vehicles in an auto show setting.

The AutoLED was needed to replace an extensive stable of daylight-based PARs with 575W discharge lamps that had been used on every GM auto show display for

that past 11 years. Due to the age of the lights, maintenance costs had gone up, so O'Neill decided to do some research into current LED technology. "I thought maybe we were at the point technologically where possibly we could create a fixture that would give us the amount of light that we're getting out of these daylight PARs but with an LED source," he says.

Before delving into fixture development, O'Neill went fixture shopping. He explains, "I've seen LED fixtures that can equal the light output of a daylight PAR; however, they're not green, they're not energy-efficient. We wanted to be really green, and we wanted to take a fixture that consumed less power, which meant less cabling, less power distribution, which meant money savings in installing and putting up a lighting rig."

Since there was nothing on the market that filled his needs, O'Neill became a de-facto developer—all with the approval of his client, GM's lighting designer, Jim Tetlow, of Nautilus Entertainment Design (NED) of San Diego. O'Neill explains, "During the development process of the fixture, I kept Jim in the loop every step of the way, and, when we had a good final working prototype, he came out, looked at it, and was quite amazed."

A.C. Lighting Inc., of Toronto, became his first partner. "A.C. Lighting's sister company, Spectrum Manufacturing Inc., a designer and OEM manufacturer of innovative and high-quality professional lighting products, had prototyped a high-intensity 'direct illumination' white LED fixture for the entertainment market based on some of the design principles found in the innovative Chroma-Q Color Force LED lighting range," says Fred Mikeska, VP of sales and marketing at A. C. Lighting. "After seeing the fixture in Spectrum's R&D lab, it seemed as though the prototype had the intensity that Rick required to meet the needs of his project."

The LED prototype at Spectrum was exactly what O'Neill needed to illuminate GM's auto show display. It had the intensity that he required (20,000 lumens), as well as the energy requirements (less than 330W.) "The AutoLED is a custom unit which incorporates some of the very latest engineering and LED technology found in the Chroma-Q Color Force fixtures, including lens and dimming technology," explains Mikeska. The AutoLED (humorously called the "ParsOnCars" in development at Spectrum) is comprised of 96 high-intensity "daylight white" LEDs, which have a L70 lamp life of up to 50,000 hours, thus cutting down on bulb replacement on the show floor.

Intensity and energy-efficiency were just two of O'Neill's requirements. "We wanted to be able to pan and tilt for ease of focusing, and basically change the size of the beam," he says.

Of those requirements, the ability to change the size of the beam of the LEDs was perhaps the most challenging. However, O'Neill had an idea. "We had been using the Luminit Light Shaping Diffusers for a few years on LEDs, and I came up with the idea of using that in a scroller," he says.

Luminit Light Shaping Diffusers (LSD), manufactured by Luminit LLC, of Torrance, California, is a patented alternative to traditional diffusion. "Regular diffusion gel is just roughened polyester that scatters light indiscriminately," says Jeff Mateer, product manager at Apollo Design Technology. "Luminit takes that same polyester, and photo-etches arrays of micro lenses into the surface. These micro lenses provide accurate control of the light direction and distribution, with optical efficiencies approaching 92%."

Luminit comes in the form of sheets, rolls, and screens and, to make it work for O'Neill, the R&D engineers at Apollo Design Technology modified the Smart Color Pro

scroller to use a custom gel string with the Luminit material. Luminit comes in a variety of beam angles; O'Neill chose the 10°, 20°, and 30° versions for use in the gel string. "When you see it work in a lab, it's like a zoom ellipsoidal," notes Mateer. "On site, if there was too much light on a car, they could go to the next frame on the gel string and diffuse it out."

The next hurdle for the AutoLED was indeed making it automatic. A variety of press events take place before the



show's public exhibit, which, from a production standpoint, can be challenging. O'Neill says, "We have a press event the day before, and the press doesn't get struck and out of the space until five in the morning—but we have to be show-ready at 7am, and sometimes it's physically impossible to do it." Consequently, the most effective way to address refocusing is through the use of an automated fixture.

In other words, O'Neill needed a way to make the AutoLED into a moving light. Once again, Apollo Design Technology had the answer, in the shape of the Right Arm, which, Mateer says, "is a simple pan-and-tilt device for many lighting fixtures and other static gear like cameras, projectors, speakers, and even confetti canons."

The LEDs, the modified Smart Color PRO scroller, and the Right Arm were the exact combination that O'Neill needed to create the AutoLED. The only remaining issue to be addressed was control. At this point in the process, there were three separate units, not one single DMX unit. So the software team at Apollo got busy and wrote a custom program for the AutoLED. Instead of three start addresses per unit (one for the Right Arm, one for the LEDs, and one for the scroller), the Right Arm sends a mapped DMX signal to the LED and scroller. "One start address controls all param-



The AutoLED.

eters for the whole fixture,” says Mateer. It was exactly what O’Neill needed.

The number of units that O’Neill required was significant. “When you’re talking a quantity of 400, you like to build four first, but we didn’t have that opportunity; once they started rolling in the door for final assembly, it all had to work,” says Mateer.

Final fabrication took place at Apollo, and the product had to be ready to ship by November. “If the components didn’t fit on November 1st, that really would have been problematic,” comments Monty McWilliams, VP of marketing at Apollo. A ten-person assembly team created 400 AutoLEDs and, according to Mateer, “We moved a 100,000lbs of aluminum.”

The accelerated timeline was a challenge for both A.C. and Apollo. “It was incredibly tight and everyone involved did their part to keep the project on schedule,” says Mikeska. “Spectrum Manufacturing worked overtime and weekends to produce the Chroma-Q portion. A.C. Lighting arranged shipments with a freight company that would pick up on our dock in Toronto and drive overnight to Apollo in Ft. Wayne.”

The story at Apollo was similar. “We would receive pallets from AC in the morning and ship finished product in road cases the following day,” says Mateer. The companies’ rela-

tive locations—Light Source in Michigan, A.C. Lighting in Toronto, and Apollo in Indiana, were also beneficial for all involved. “For Apollo, our Midwest location continues to pay dividends,” notes McWilliams.

With 400 AutoLEDs in Cobo Hall, O’Neill had one final challenge: achieve a quick turnaround between the press events and the public exhibit. In Detroit, GM is traditionally one of the largest exhibitors (76,000 sq. ft.) including impressive stages for both Buick and Chevy and a glass floor for Cadillac. Refocusing needed to be done as quickly and as efficiently as possible. This time, however, the solution was easy for O’Neill. “We purchased iPod touches for all of our focusing supervisors, used them with the grandMA lighting console and created a wireless network,” says O’Neill, “Now, when we set the system up, the guys walk around with an iPod touch, and from on the ground or from the iPod touch, they can focus all the lights.”

The key was an app provided by grandMA that O’Neill has been using for several years with PDAs; this year, he moved to the iPod Touch. “We split the system into six zones—each focus supervisor can have access to their particular zone, and they can only control and manipulate the lights in their zone,” he explains. Doing a remote focus also meant that there was “no rolling a big clunky desk around the show floor with an umbilical cord tied to it.”

As one might expect, the AutoLED (as well as O’Neill’s preferred method of focusing) garnered quite a bit of attention at the show. “It’s been pleasantly surprising to see other people recognize that there’s something there and it’s interesting, and to hear the other applications that they want to use them on,” says O’Neill.

The first 400 AutoLEDs are part of GM’s proprietary inventory. For the Chicago Auto Show (which was held earlier this month) O’Neill commissioned 100 more, which are part of Light Source’s stock. “I have other applications for it, and other projects that people have been requesting them on,” he says. It will also be part of GM’s exhibit at the New York Auto Show, which takes place April 22-May 1.



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