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Amish Buggies Enter High-Tech Era with LED-Powered Headlights and Taillights

Buggy Builders Embrace Luxeon LEDs from Lumileds Lighting for High Brightness, Energy Efficiency and Longer Battery Life

SAN JOSE, CA (August 7, 2003) — Lumileds Lighting announced today that its high-brightness Luxeon LEDs are being used to power headlights, taillights and marker lights for horse-drawn buggies used by the Amish. The religious sect, known for its rejection of modern conveniences such as cars and electricity, is beginning to replace the buggies' incandescent and halogen lighting systems with semiconductor-based illumination largely because of energy efficiency that dramatically lengthens the life of carriage batteries.

"With conventional lighting systems, buggy owners have to drag a 60- or 70-pound battery out of a carriage and lug it over to a charging station after roughly six hours of operation, which typically translates to every two weeks," said Elam Beiler, President of Sunline Solar Inc., a part-Amish-owned alternative energy firm in Pennsylvania that sells Luxeon-powered lighting assemblies to Amish carriage shops that in turn offer them as options to their customers. "With LEDs, the buggy battery stays charged for as much as 100 hours of run time, so recharging is required only every six months."

Because LEDs are constructed of unbreakable solid-state components with plastic lenses, they are also a better choice for the long unpaved driveways in Amish communities that can wreak havoc with the fragile filament and glass in traditional bulbs. In addition, Beiler predicts that widespread adoption of LEDs in Amish buggies will make it possible to reduce weight of carriage batteries by half in coming years.

"There is some irony in the fact that a culture that resists most of the ingredients of a modern lifestyle is embracing a Silicon Valley technology, and in some sense the

Amish are even ahead of the technology curve because LED-powered headlamps are available in Amish buggies before they are even available in cars," said Fran Douros, Americas Marketing Manager at Lumileds Lighting. "At the same time, the Amish consider themselves stewards of the earth, and the exceptional energy efficiency and long life of LEDs fit right in to that agenda."

The ability to use LEDs to provide illumination for Amish buggies, as well as a wide range of other products, reflects recent technological advances that have boosted both the brightness and the efficiency of solid-state lighting from the days when light-emitting diodes were powerful enough only to be used as indicator lights on items such as computer printers.

Today, Luxeon LEDs are more than 100 times brighter than the earliest light-emitting diodes and up to 60 times more powerful than other high-brightness LEDs on the market. That world's-brightest status is helping to accelerate adoption of LED-powered lighting in Amish buggies because the need to use fewer LEDs per assembly is making the prices of LED lighting systems competitive with incandescent and halogen offerings.

A buggy taillight constructed with a single Luxeon LED, for example, produces light output equivalent to that generated by 20 standard LEDs. It costs much less to engineer a taillight with one LED than mounting, wiring and managing 20 LEDs on a circuit board. As a result, the cost of a Luxeon-based taillight is now so close to that of incandescents that one Pennsylvania carriage shop recently stopped offering incandescent versions in favor of Sunline Solar's LED-powered rear lighting system.

Similarly, the LED-based headlight recently introduced by Sunline Solar consists of just eight Luxeon LEDs that generate the brightness of a 35-watt halogen lamp. Roughly 100 standard LEDs would be needed to produce equivalent light output, and even then the headlamp would not be able to project light at the required distance without special optics that are already built into the Luxeon package.

Luxeon LEDs also offer distinct advantages over other solid-state light sources for Amish buggies because they offer a broader beam pattern that makes the marker lights that extend from both sides of a buggy more easily visible from all angles. This is significant because difficulty in seeing buggies on the road has caused numerous accidents between buggies and automobiles.

In addition, Lumileds' Luxeon LEDs share the energy efficiency advantages of all solid-state lighting. As much as 90% of the wattage generated by incandescent and halogen light bulbs goes to waste because these light sources generate unneeded colors that must be filtered out to produce a red taillight and other colored lighting products. LEDs use far less energy because they supply pure color without the need for filters and deliver more brightness per watt. LED fixtures such as Sunline Solar's can last for as long as 11 years, virtually eliminating the need for replacement.

About Lumileds Lighting

Lumileds Lighting is the world's leading manufacturer of high-power LEDs and a pioneer in the use of solid-state lighting solutions for everyday purposes including general lighting, automotive lighting, traffic signaling, signage and LCD backlighting. The company's patented Luxeon Power Light Sources are the first to combine the brightness of conventional lighting with the small footprint, long life and other advantages of LEDs. Lumileds also supplies core LED material and LED packaging, and manufactures billions of LEDs annually. A joint venture between Agilent Technologies and Philips Lighting, Lumileds is headquartered in San Jose, California, with operations in the Netherlands and Malaysia and sales offices throughout the world. For more information, call Lumileds at 408-435-6111 or visit www.lumileds.com.

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