CARMANAH TECHNOLOGIES

Illumination for the Future

Headquartered in Victoria, BC, **Carmanah Technologies Corporation** [CMH-TSXV] is a world leader in navigational and hazard lighting. Carmanah's technology was originally developed for the marine industry but has found many other applications. Research and development commenced in 1996 and on July 6th, 2001, Carmanah Technologies began trading on the Canadian Venture Exchange. The company has continued to grow, and in 2002 reached a significant milestone as it celebrated the installation of over 50,000 LED (light emitting diode) units. Currently, the technology is in use in more than 110 countries, with annual sales of over CDN $6.4 million. The year 2002 also represented the first time Carmanah achieved profitability as a public company. This was a considerable achievement as it also expanded its production facilities threefold during the year.

Most recently this innovative company has focused its attention towards the natural resource industry by launching a specialized line of lighting products directed toward mining applications, in particular the gravel and aggregates industry.

Mining quarries have long struggled with a variety of safety issues. Moving vehicles, poorly marked pedestrian pathways and hazards have all affected their safety record. Carmanah's unique solar powered, LED lights and in particular the 201, 501, and 601 Series, featured below, offer a cost effective alternative which will permit the quarry manager to further enhance safety in the workplace.

In addition to effectively utilizing LED technology, Carmanah has combined it with the use of solar powered technology, as holders of the "Sealed – Solar-Powered Assembly" patent. This patent integrates high-powered LEDs, and efficient solar panels combined with a power management system all encased in a sealed unit that is virtually indestructible. Carmanah's technology is unique in that the solar panels are encased in a polymer, which is built into each side of the light, allowing the sunlight to be trapped from any direction. This, combined with a sophisticated internal power management system, permits the units to function continuously with as little as 1.5 hours of daylight.

Requiring no cabling, or wiring, the lights are installable in a variety of previously inaccessible locations. Visible up to two miles, they are available in a variety of different colours including green, red, white, amber and blue. Easy installation, and high visibility, coupled with low maintenance requirements makes these lights an ideal solution, able to withstand the rigorous demands of a working quarry.

LED's have become an increasingly popular alternative to traditional incandescent lighting and may one day represent a significant portion of the $12 billion global illumination market. An LED is a semi-conductor chip that emits light when electricity passes through it. The LED is nearly 100x more energy efficient than its traditional counterpart, the incandescent bulb, in which nearly 85% of the electricity consumed is dissipated as heat. LED's were originally only used as indicator lights; however, recent technological advancements have increased both their brightness and range of colour availability thereby increasing their applications. LED's are now used in traffic lights, brake lights, navigation lighting and most recently their application in household lighting is being investigated, where they could cut hydro bills by up to 90%, representing a substantial costs savings to consumers.

LED's, although only now gaining popularity with consumers, have in fact been in existence for over 30 years, with sales increasing at a phenomenal rate of 58% per year for the past five years. The primary element in the manufacturing of LED's is gallium. US demand for gallium increased nearly 300% between 1991 and 2000 and demand is expected to continue to increase. Gallium is found as a trace mineral in bauxite (the primary ore of aluminum) and coal. To date, no stand-alone gallium mines exist, although Gold Canyon Resources is exploring a gallium prospect in Nevada. In fact, nearly 95% of all gallium produced is a by-product of bauxite. The major producers of gallium as a by-product are Australia, Russia, Hungary, China, India, France and Kazakhstan.

Carmanah is continuing to make significant strides in bringing LED technology to mass market, and expects to see continued growth in its operations in the years to come.

Able to withstand the rigorous demands of lighting at a mining operation, the Carmanah LED's have no wiring and can therefore be mounted anywhere. The 501 is visible up to 0.5 miles, the 601 can be seen for up to one mile and the 201 hazard marking light has a visibility up to 1.6km. *Photos courtesy Carmanah Technologies Corporation.*