IECEx-certified cordless caplamps make underground mining safer

Underground mines are hazardous environments. Fire, flood, explosion and collapse are among the potential dangers to the many people who work in them. Miners work in confined spaces with low lights and visual contrasts that increase manifold the risks of injury or death. Proper illumination and protection against Ex (explosive) atmospheres are critical in such harsh conditions.

Kinyun Australia's cordless caplamp series recently was awarded IECEx certification

Slow development for a century…

The first electric mine lamps appeared in the early 1900s and lead-acid battery and incandescent light-bulb miners' caplamps have been used for more than a century. But inventors and manufacturers were confronted with numerous problems. Could lamps be made that would not ignite mine gasses? Could they produce enough steady and uninterrupted light for at least one shift? Would they burn in any position, be bright enough, simple to operate and durable?

…rapid evolution in the 2000s

Thanks to the rapid development of various technologies, compact rechargeable batteries have significantly advanced in the past decade. LEDs (light-emitting diodes) have become increasingly more efficient. Today's integration of compact rechargeable battery cells with highly energy-efficient white LEDs into an IP67 caplamp case, compliant with IECEx protection requirements, has made the traditional belt-worn battery pack and electric cord redundant. [IP refers to Ingress Protection Rating codes. See below for an explanation.]

The first cordless caplamps

An Australian company, Kinyun Australia, developed a cordless caplamp a few years ago. The lamp was designed with miners' security and comfort in mind. It dramatically reduced the risk of injury and eliminated accidents caused by tripping on electrical cables.

This first model also had a number of features that significantly improved the safety of the lamps. Because there was no battery, there was no acid or toxin to spill, no heat on lens surface, no burning parts to cause fire. The elimination of the battery and cable also improved work efficiency. Last but not least, the low maintenance of this new product drastically reduced costs.

In 2006, the first cordless caplamp was granted certification by IECEx, the IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres. The product became very popular. More than 100 Australian mines embraced the new technology.

Ex protection

In subsequent years, Kinyun fine-tuned the lamp and expanded its product line to include models such as external charging lamps, light-weight lamps, flood light lamps, side-worn lamps, rear beacon lamps, traffic control lamps, rescue lamps and multiple-pattern beacon lamps.

The complete cordless caplamp series recently was awarded IECEx certification by TestSafe Australia. Every model is also certified as a helmet lamp because it can be worn on any helmet.

IECEx has been testing and certifying equipment used by the mining sector for many years.

Ingress Protection Rating codes

The IP (Ingress Protection Rating) code is defined in IEC 60529, *Degrees of protection provided by enclosures (IP Code)*. It classifies the degrees of protection provided against the intrusion of solid objects (including body parts like hands and fingers), dust, accidental contact and water in electrical enclosures.

The first digit of the code indicates the level of protection that the enclosure provides against access to hazardous parts (e.g., electrical conductors, moving parts) and the ingress of solid foreign objects. The second digit indicates the protection of the equipment inside the enclosure against harmful ingress of water. Therefore, in the case of Kinyun's cordless lamps, IP67 means that the lamps are dust tight (first digit Level 6) and protected against the effects of immersion (second digit Level 7).

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IEC links

IECEx
IEC System for Certification to Standards relating to Equipment for use in Explosive Atmospheres

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