

Sudan lithium-ion batteries

Industries worldwide are making a great effort to limit their carbon footprint and reduce their greenhouse gas emissions, and a key factor in this transition is the adoption of renewable energy sources. In today's technologically advanced mining industry, where portable air and power are increasingly crucial, batteries play a key role in enhancing productivity and operational efficiency.

In recent years, three primary types of batteries have been the most widely used in industrial applications such as mining: lead-acid batteries, nickel-iron (Ni-Fe) batteries and lithium-ion (Li-ion) batteries. The latter, Li-ion batteries, are recognized for their versatility and high efficiency, making them suitable for a diverse range of applications due to their high energy density, relatively low self-discharge rate and lack of memory effect.

One of the most notable advantages of lithium-ion batteries is their ability to withstand numerous charge and discharge cycles without significant degradation in capacity. Unlike other battery technologies, which can experience a rapid decline in performance after a limited number of cycles, lithium-ion batteries can withstand hundreds of cycles while maintaining optimum performance. This endurance not only extends the battery life cycle but also translates into a more profitable long-term investment.

The memory effect, which used to be a common problem with traditional batteries, is not a concern with lithium-ion batteries. Unlike older batteries that require complete charge and discharge cycles to maintain their full capacity, lithium-ion batteries do not suffer from this phenomenon. The convenience of being able to charge at any load level adds significant value to the operation and prolongs battery life.

The recent launch of Atlas Copco's B-Air, the world's first battery-powered portable screw compressor, marks a turning point in the transformation of the mining industry towards a more efficient and lower-carbon future. Making the switch from an internal combustion engine to an electric motor brings with it several benefits, including no local emissions being produced - in fact, the B-Air 185-12 saves 140 tons of CO₂ emissions, which is equivalent to the yearly exhaust of around 30 passenger cars.

It also drastically reduces downtime and maintenance because the B-Air 185-12's electric motor has far fewer moving (and therefore wearing) parts compared to a diesel engine compressor, it only needs service every 500 hours, as opposed to 2,000 hours for a diesel engine unit. Meanwhile, the battery pack is protected in a triple enclosure, and is liquid-cooled to maximize performance.

The state-of-the-art variable speed drive (VSD) and its magnet motor automatically adjusts motor speed to meet real-time air demand, increasing energy efficiency by up to 70 %.

Like all Atlas Copco portable air compressors, the B-Air has undergone a rigorous testing process, proving that it performs optimally even in the most extreme climatic conditions: from +45°C to -25°C.

Relying on battery-based energy storage systems (ESS) provides mining companies with full control over their temporary power applications, by optimizing energy generation, distribution and consumption. Atlas Copco's energy storage systems, comprising the ZBP and ZBC ranges, are fit for installations in remote and hard-to-access locations - often the case in quarries and underground mines. These units are ideal for applications with a high energy demand and variable load profiles, boosting the grid available when it is limited, and accounting for both low loads and peaks.

Although traditionally diesel-driven light towers have been used to illuminate mining sites, increasing the working day and ensuring safe conditions, more energy-efficient alternatives have been developed in recent years. Electric and solar light towers can eliminate fuel consumption, enabling operators to benefit from cost-cutting solutions, that adhere to noise, light and CO2 emission regulations.

Atlas Copco's latest solar light tower, the HiLight S2+, features lithium-ion batteries that store the energy released by the sun, captured by its photovoltaic panels and used to power its four 90W LED floodlights. This innovative light tower delivers efficient, high performance, giving workers good visibility, and providing autonomous operations all year round with favorable weather conditions.

In addition, operators have seen a new type of lighting solution rise: the hybrid light tower. Atlas Copco has recently launched the HiLight BI+ 4, which combines the use of batteries with a low-consumption Stage V diesel engine for maximum flexibility. Introducing the ability to use batteries reduces the use of the engine, which extends the unit's lifetime and results in a temporary lighting solution with a low Total Cost of Ownership (TCO).

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Web: <https://www.sumthingtasty.co.za/contact-us/>

Email: energystorage2000@gmail.com

WhatsApp: 8613816583346

