

## Aramine

Several years ago, the industry embarked on its electrical revolution. Aramine, the French manufacturer specialising in small and medium-sized underground mining sections, was immediately committed to developing electric machines, convinced that they represented the future of the sector.

### From cable reels to batteries

First, by offering electric machines where a cable reel permanently connects the machine to an electrical socket. Then, 10 years ago, its teams launched the battery-powered L140B mini loader, with a tramping capacity of 1.3 t. The aim was to offer a machine with zero CO<sub>2</sub> emissions that was more manoeuvrable and independent than a cable-operated machine. Technological developments have also made it possible at the time to offer high-performance batteries suitable for narrow vein mines.

In this booming sector, each manufacturer is developing its own battery recharging system. Aramine has opted for an all-in-one energy module that houses the batteries and the charger. With the rear of the machine completely detachable, the batteries can be recharged close to any electrical socket.

Technological progress is opening up exciting prospects, with the arrival on the market of ever more powerful batteries. Since 2023, for example, Aramine has been offering a 42 kWh battery pack, compared with the 24 kWh previously available, which means longer operating times: 4 to 5 hours, compared with 3 to 4 hours with the previous batteries. The recharging time remains unchanged (4 hours), enabling a machine with two energy modules to operate without interruption.



Figure 1. Aramine's L440B mining loader with a tramping capacity of 4.2 t, arriving in 2024.

### A major impact on the mine's carbon footprint

The benefits are numerous, not least for the working conditions of operators, with less noise, heat, and CO<sub>2</sub> emissions. According to the European Union's ADEME CO<sub>2</sub> emissions factor, over 8000 hours of use, each L140B reduces CO<sub>2</sub>e by 61.5 t, compared with its diesel-engine equivalents.

In addition, the increased performance of batteries is paving the way for the arrival of bigger and bigger machines. In 2024, Aramine will launch the L140B's 'big sister', the L440B loader, with a tramping capacity of 4.2 t, more than 3 times greater than its little sister. The French manufacturer is thus extending its range of electric machines, which are no longer reserved exclusively for narrow vein sections.

Aramine's engineers are keeping a close eye on developments in battery technology. For the moment, they are not powerful enough to equip large vehicles operating over long distances for long shifts. However, there is no doubt that this will be possible in the future, and that a complete range of electric vehicles meeting all needs will emerge. Mining companies are now fully committed to this important transition, and are gradually replacing their fleet of diesel machines.

### Using renewable energy to go even further

As mines are often located in isolated areas, battery-powered machines also avoid the need for regular diesel supplies. To overcome the challenges of electricity supply, Aramine is turning to renewable energies. A recent project has been developed with their partner Tysilio: to offer a solar power station in kit form, to be installed near the mine, and which provides a sufficient supply of electricity to recharge the batteries of the L140B charger. This system makes the site completely self-sufficient, particularly for

mines located in countries with long periods of sunshine.

Aramine has been involved in this new era in the mining industry from the outset, and will continue to play its part in the electrification of underground mining machinery, an issue that is more relevant than ever. **GMR**