

Adopting high voltage battery solutions

WHAT ARE THE CONCERNS FACING OEMs WHEN ADOPTING HIGH VOLTAGE BATTERY SOLUTIONS? IVT TALKS TO INDUSTRY EXPERTS MARCO RIGHI, FOUNDER AND CEO OF FLASH BATTERY AND ANTON EBERHARTER, ATECH GMBH'S MANAGING DIRECTOR TO FIND OUT MORE

▶ An increasing number of machine and industrial vehicle manufacturers are switching to electric – motivated by the many advantages in terms of sustainability, operational flexibility and a favourable total cost of ownership over time. The sector's rapid technological advances have enabled even heavy-duty industrial applications with high performance and autonomy requirements to tackle the green transition thanks to the use of high voltage batteries.

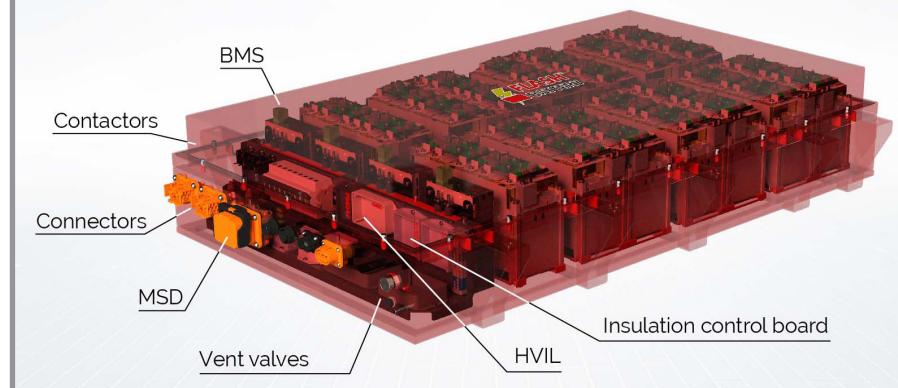
High voltage batteries in the industrial world start from voltages above 300V and can exceed 800V. They are used to power electric motors with outputs of more than 40kW, which require high voltage to ensure compactness and efficiency. "In the German market high-voltage batteries are particularly popular in on-road vehicles such as buses and trucks, and in off-road vehicles such as heavy-duty machinery for construction, agriculture and container handling," says Anton Eberharter, Atech GmbH managing director.

Addressing the risks

Despite the many benefits of high-voltage batteries, the sector still faces several challenges. "These technologies must overcome technical challenges, cost pressures, regulatory compliance and long-term sustainability," says Eberharter. "The spread of high-voltage batteries is also hindered by several practical factors such as the limited space in mobile machines, which complicates HV component integration, the lack of suitable charging infrastructure and the shortage of qualified personnel."



HIGH VOLTAGE LITHIUM BATTERIES AND SAFETY



ABOVE: Flash Battery's high voltage lithium battery with key safety components

BELOW: From left: Marco Righi, Elisabetta Orlandi, CEO and business developer of Flash Battery and Anton Eberharter, managing director of Atech GmbH

Addressing the potential risks associated with high-voltage batteries safely requires the adoption of strict safety protocols and the support of a lithium battery supplier with proven industry experience. Flash Battery, an Italian manufacturer of customised lithium batteries for the industrial sector, views safety as not just a plus but a global approach that guides every stage, from design to production and use of the battery pack. "Since 2012 there are three fundamental aspects we work on each and every day to ensure the total safety of our batteries starting from the design stage: the choice of the right chemistry, cell assembly and battery control electronics," emphasises Marco Righi, Flash Battery founder and CEO.

Safety at the core

"LFP chemistry is the safest and most stable – available in large-capacity formats as required by industrial systems. Cell assembly is fundamental to determining safety. Specifically, the capacity – the number of cells connected in parallel within the battery pack – is decisive. At the same time,

the development of advanced proprietary control electronics makes it possible to exploit the chosen chemistry to the fullest and ensures not only safety, but also consistent performance and long-term reliability," says Righi.

It is precisely the control electronics that play a key role in ensuring battery pack safety. The proprietary Flash Balancing System was developed to act on each individual cell through combined high-power balancing (20 A), ensuring balancing times of less than 30 minutes and full, constant control of the battery pack.

Component choice also plays a primary role in ensuring the safety of a high-voltage pack. This includes the High Voltage Interlock (HVIL) system which monitors the proper connection of high-voltage components, the Mechanical Safety Disconnect (MSD), a device that is manually operated during maintenance/emergencies, and the insulation monitoring boards which constantly monitor the insulation resistance between the battery's high-voltage electrical parts and the surrounding vehicle chassis.

For Flash Battery, safety is a holistic approach that must encompass every facet, from design to the production and use of a product, especially when it comes to a key component of a vehicle like the battery. **ivt**



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