



application without distinction (the batteries are standard and of equal size; one is the same as the other), can sometimes be a problem.

Customisation for adaptation

With modular batteries more modifications to the vehicle/machine are required. This means the manufacturer has to find the space in its product to house the standard modules by moving whatever is in the way. When adaptation is an issue due to specific design constraints, choosing a customised battery pack is the best way to go because the geometry of the battery can be 'moulded' to fit the machine/vehicle spaces without having to make any design changes.

Customisation is king

Introducing optional elements in modular batteries is also costly and not recommended since this would have to be replicated on each module, making the interconnections and specific functions less flexible and increasing overall costs. A custom battery pack, on the other hand, can be adapted to the application's electrical requirements, such as, for example, by integrating more inputs and outputs or including special functions like pre-charge or insulation control.

In order to come up with the electrification project best suited to the needs of the



ABOVE: Flash Battery helps its customers choose the solution that best fits their need

LEFT: Company founder and CEO Marco Righi works closely with his mechanical engineer

mechanical and electrical customisation levels and to go in-depth into every project to enable customers to consciously choose the system that is the best fit for their needs. **IVT**

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Modular or custom battery solutions?

DECIDING WHICH IS THE BEST LITHIUM BATTERY SOLUTION FOR YOUR VEHICLE IS A COMPLEX PROCESS. THIS GUIDE WILL HELP OEM ENGINEERS TO MAKE THE RIGHT DECISION

▶ What's the best lithium battery for my application? This is a common question when industrial machinery and electric vehicle manufacturers begin to approach an electrification project. Analysing each detail of the product – the type of application, its consumption and size, as well as the spaces, weights, working environment, and mode of use – can make a difference and is crucial in giving birth to the perfect lithium battery for the manufacturer.

Flash Battery's R&D department has developed mostly custom lithium batteries over the years, examining the requirements of each project and developing solutions specifically intended for the application. Sometimes, however, manufacturers have a need to equip the product with varying

ranges and this is where modular batteries come into play to meet that need.

The modular solution

Battery pack modularity is a mostly firmware function that makes it possible to install several battery modules in parallel in the same application. Each module can be configured as a master battery, slave battery, or even as a stand-alone battery. To increase the applicability of this system, Flash Battery developed a guided step-by-step procedure that walks the manufacturer of the modular system through the battery installation process.

With this function module configuration is automatic, creating a single virtual battery of higher capacity. In addition, the function makes it possible to remotely monitor the

battery at any time using the Flash Data centre portal. Therefore, modularity brings simplified battery capacity management and high scalability combined, providing added advantages to the supply chain management.

One battery code per application

When manufacturers have several products in production, each one with its specific energy needs - for example a range of vehicles with different range requirements – they could use a single module for the small vehicle and two or three modules for the larger one. This solution would enable manufacturers to purchase just one battery code for every application, simplifying the supply chain.

Standardisation of modular systems, which use several parallel battery packs inside the

LITHIUM BATTERY FOR INDUSTRIAL MACHINES AND ELECTRIC VEHICLES

Since 2012, Flash Battery designed and produced **more than 12,000 lithium battery packs**, studied and customized **over 500 different battery models** and provided more than **200MWh** in several applications. Lithium Flash Batteries are today installed in **more than 54 countries** and are daily and automatically monitored by a proprietary remote-control system, the **Flash Data Center**. **Choose the charge of the future.**

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Example of customized battery for an EV project



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