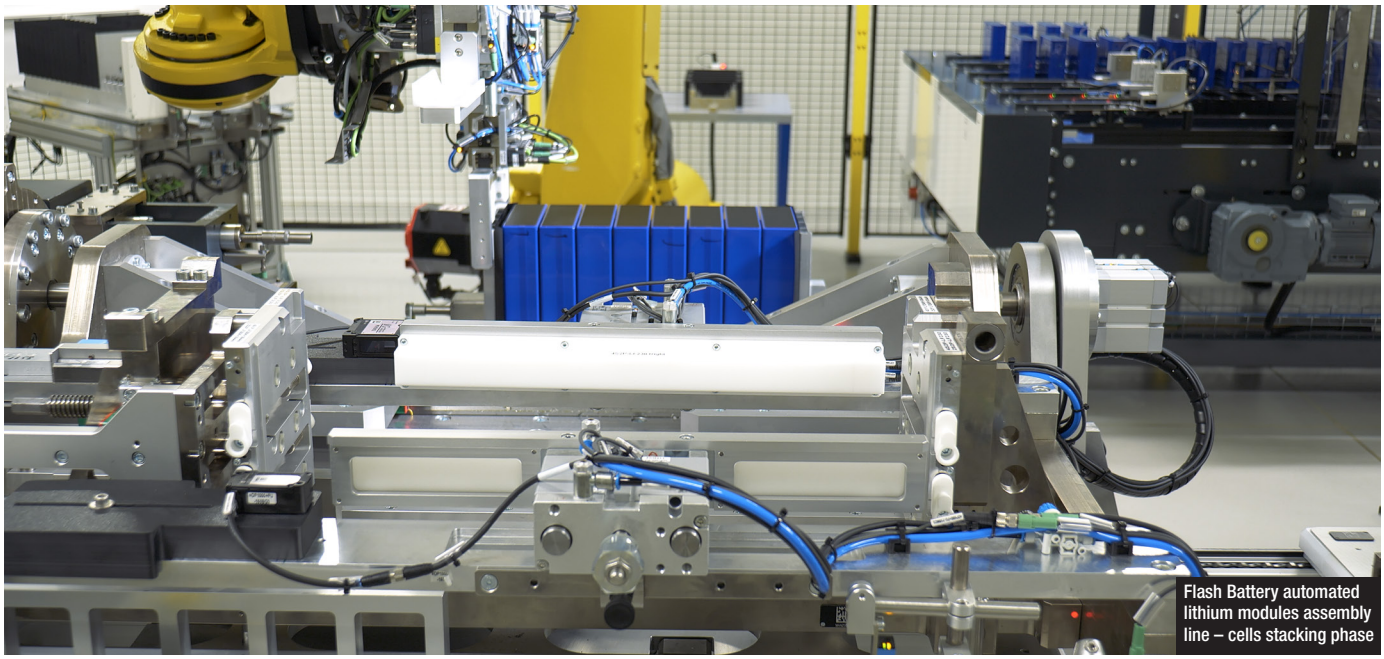
60 SECONDS WITH... FLASH BATTERY



Flash Battery automated lithium modules assembly line – cells stacking phase

Flash Battery Co-founder and CEO Marco Righi chats with GHI Editor Sam Payne Polepaka about its latest venture: an automated lithium module assembly line.

Since its establishment in 2012, Flash Battery has evolved from a start-up to a global industry player supplying customised lithium battery solutions for the GSE and industrial vehicle sectors. Now the company has launched an automated lithium module assembly line for prismatic cells with laser welding technology. Today, Flash Battery's assembly line boasts the highest production capacity in Italy for the industrial sector.

GHI: In 2021, you inaugurated your new headquarters, and now you're launching Italy's most advanced lithium module assembly line. What's driving this rapid evolution?

Marco Righi: The trend towards electrification is growing rapidly, and since our foundation, we have chosen to focus on a niche market — industrial machines and vehicles — that is increasingly moving in this direction. As a matter of fact, the company was founded in 2012 with the goal of delivering the best battery technology for industrial machines and vehicles, a sector which has seen a gradual transition from traditional engines to electric and hybrid systems.

Through our headquarters and ongoing investments, we're committed to remaining at the forefront of this shift by providing the best technology available and supporting our customers as they navigate this changing environment. Many of them are still not confident with the change towards electrification, and we're here to guide them through this new era thanks to our customised approach and in-house know-how that covers every phase of the electrification project.

GHI: What makes this module assembly line with laser welding technology such a game-changer for Flash Battery?

MR: Three years ago we decided to install the lithium module assembly line and since January this year, we've moved to mass production, allowing us to bring all battery pack know-how in-house at our Italian headquarters — including the module. By taking direct control of production, we've significantly reduced our dependency on external supply chains. The only component we still source externally are the cells, which we purchase from leading global battery suppliers. Our line also offers the flexibility to produce exactly what we need. So, if a customer wants a specific module, we can do it.

GHI: What advantages does laser welding bring to the lithium battery module assembly that traditional methods simply can't match?

MR: It is the only way to produce a professional battery pack at scale, there are no other efficient alternative methods unless you are producing low volumes. Even before implementing our own module assembly line, we always chose laser-welded modules because, in our view, all other methods fall short of our high-quality standards. The laser welding process offers many advantages, including ensuring stronger, more reliable joints and providing robust cell fastening inside the module, delivering high resistance to the vibrations found in industrial vehicle environments. Finally, it minimises contact resistance between the cell and the busbar, reducing the heat generated by current flow.

Anya@stock-adbobe.com

GHI: Your line can assemble 90,000 modules a year across 13 configurations. How were you able to achieve that level of flexibility and scale?

MR: We have collaborated closely with the line supplier to develop a custom production line tailored to our specific needs. Having this kind of flexibility is essential for us as we manufacture fully customised lithium batteries. Typically, customers who purchase these assembly lines are limited to producing a single type of battery pack. In contrast, we worked hand in hand with the line supplier to develop a tailored line that can accommodate different kinds of modules.

GHI: You've brought nearly every part of the battery development process in-house. What has that meant for innovation, quality control and your customer relationships?

MR: Each of our electrification projects starts with a dialogue with our clients: we always work side by side with them to create batteries tailored to the specific needs of their vehicles. By working in a customised way, maintaining high standards of quality control is essential. We typically establish a tailored quality process and specific certifications for each customer, depending on their final application. In the case of GSE we also handle a variety of applications, each with its own requirements. Naturally, our customer relationships have enhanced as we work together to define the quality level that they need.

GHI: How does this new investment help you mitigate against global supply chain disruptions?

MR: Essentially, we've streamlined the process by eliminating a step in between. In the past, we used to purchase modules from Asian suppliers, who would then assemble them using cells they had sourced directly. Today, thanks to our new automated module assembly line, Flash Battery sources its cells directly from major global manufacturers, relying on multiple suppliers for each type of cell purchased. This approach is certainly more reliable, as it reduces the number of suppliers involved, gives us greater control over the supply chain and increases our bargaining power. As of today, all that remains is to focus on the cells.

At the moment, around 95% of the cells produced worldwide are manufactured in China, which is unlikely to change any time soon. However, I hope that in a few years, joint ventures can be created between Chinese cell suppliers and European manufacturers to bring technical expertise in this field to European soil as well.

GHI: Looking ahead, what role do you see Flash Battery playing in the electrification of GSE and industrial machinery across Europe and beyond?

MR: Today, the GSE sector accounts for 30% of our market share, compared to just 5% two years ago. The volume of this market has grown significantly since the Covid-19 pandemic. Obviously, my expectation for the coming years is to continue growing, with Flash Battery playing a key role by providing customised lithium battery solutions tailored to applications with specific requirements in terms of dimensions, consumption, voltage range, working cycles, and environmental conditions of use. *ghi*

Flash Battery lithium batteries for industrial machines and vehicles