**Media outlet:** International Design Engineer

# Lamination Leap

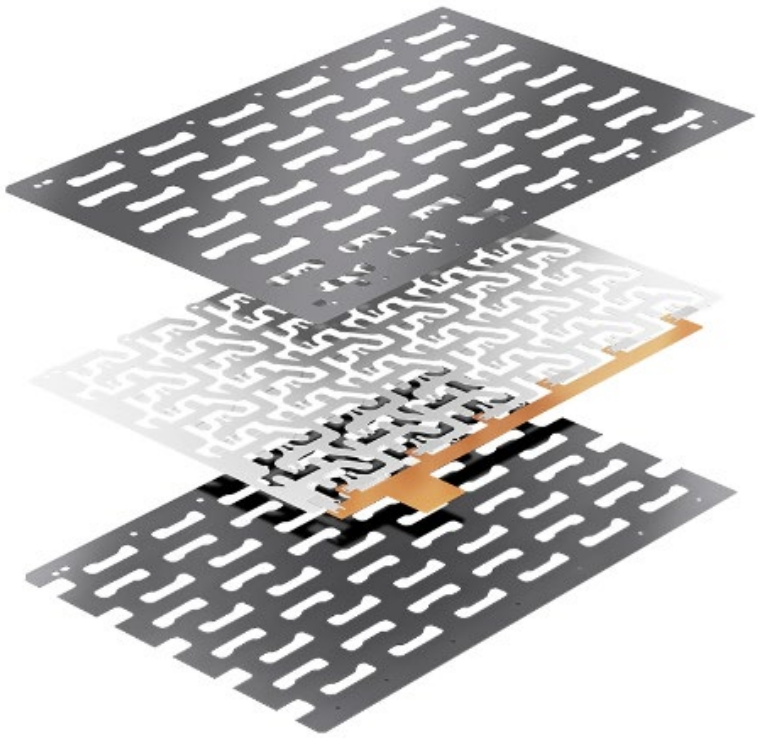
Optimising the design of battery module cell contacting systems with a novel approach to lamination

Historically the assembly of a cell contacting system (CCS) on battery cells has relied on cumbersome methods like moulded plastic trays and foams for positioning. Despite proving effective for the positioning of cells and collectors. These techniques introduce unnecessary weight and complexity to the process, especially as module sizes increase. Recognising these limitations, electric vehicle (EV) system solutions provider Ennovi has introduced an innovative CCS lamination approach that eliminates the need for trays or foams.

“Our move towards lamination signifies a major leap in our ability to position collectors with precision without the mechanical constraints imposed by conventional methods,” says Till Wagner, Product Manager for Energy Systems at Ennovi. “By curating a database of pre-tested PET foils and adhesives, we not only accelerate CCS design but also simplify the assembly process, opening up new possibilities for material and energy savings.”

**Hot or cold**

Ennovi's ability to offer hot or cold lamination processes positions the company uniquely in the market providing both flexibility and efficiency to its global OEM and Tier 1 customers. “The process involves removing liners and positioning of the sheets and other subcomponents, like alu current collectors.” Wagner explains, “Secondly, there is a step to activate the adhesive. This can be done by pressure, pressing down or rolling over, in the case of cold lamination. In the case of hot lamination, which involves adhesive that requires pressure and heat to activate, it can be done using the process mentioned before with the addition of heat. Lastly, positioning has to be secured for curing time. Once this is done, the product can be moved onto the next process step.”



*Lamination technology optimises current collectors in EV batteries*

**Qualifying material combos**

As part of its lamination approach, Ennovi has qualified polyethylene terephthalate (PET) insulation foils and adhesives from multiple suppliers in order to amass a database of recommendations for the most effective material combinations. By testing the foils and adhesives for their bond strength, durability and environmental impact the firm is bypassing the trial-and-error approach that has long been a staple of the industry.

“We can use all kinds of foils and thicknesses” Wagner adds “A commonly used foil is PET, due to its lower price point. The choice of foil has to be validated for mechanical, thermal and electrical strength to meet the application requirements. The lamination works to bond other subcomponents and materials like aluminium, PI layers plastic parts, and so on.”

By optimising the selection of PET foils and adhesives, the structural integrity and lifespan of EV battery modules can be significantly improved while manufacturing cycle times and environmental footprint can be reduced. Working to lead the charge in next-generation EV battery module design and assembly. Ennovi is focusing on developing methods that reduce or eliminate the need for glue, thereby addressing concerns over longevity environmental impact, and manufacturing efficiency.

“Our goal is to move beyond traditional adhesives, leveraging cutting-edge techniques to achieve a stronger more sustainable bond,” Wagner adds.