

eMove360° Battery Conference 2021

16 - 17 November 2021



Richard Clark

Morgan Advanced Materials

Global Lead, Energy Storage

Abstract

Thermal runaway protection - optional or indispensable?

In almost every presentation relating to the development of the electric vehicle (EV) and energy storage system (ESS) markets, significant attention is paid to the ongoing need to reduce cost to make new technologies competitive with incumbent solutions.

It is inevitable that all costs related to lithium-ion batteries are scrutinized, since where these are used the battery pack is about 30% of the total for an electric vehicle and frequently even higher than this for an energy storage installation on a project basis. New architectures designed to help bring down overall costs include cell-to-pack and, in the case of EVs, cell-to-vehicle integration.

However, the primary reason why lithium-ion batteries are becoming ubiquitous in these applications is their high energy density and this derives from their high voltages which are only possible because of the use of specialized electrolytes, most typically mixtures of flammable alkyl carbonates. This means that there will occasionally be catastrophic failures which present unacceptable safety risks and yet introducing materials solutions to address these add to the cost, presenting an apparent dichotomy.

This talk will address several ways to address the challenges of thermal runaway, minimizing the risk without unacceptable economic penalties. It will also introduce a new solution designed specifically to address the challenge in pouch and prismatic cells.

Richard Clark

CV

Educated as a chemical engineer at the University of Cambridge in England, Richard Clark has been with Morgan Advanced Materials (LSE: MGAM) for over 30 years, developing and commercializing carbon and ceramic materials and components. He leads Morgan's work in energy storage, which encompasses all businesses related to lithium-ion batteries and fuel cells as well as products directly or indirectly related to electric vehicles. Most recently he has focused on the manufacture and use of ceramics in and around lithium-ion batteries, for which he has several patent applications (including one granted) as a named inventor.