

## Environmental Exposure Effects on Battery Cell Packaging Material

Zoe Zhou, Will Rickert, Kent Snyder and Ted Miller  
Research and Innovation Center, Ford Motor Company  
2101 Village Road, Dearborn, MI 48121 USA

The design of a Li-ion battery can impact a variety of characteristics of individual cells and of the resulting battery pack system. The pouch cell format offers the potential for low cell-level part count, light weight at the cell level and cell-level design flexibility; however, design considerations to accommodate the impact of environmental exposure on the pouch cell configuration may present potential challenges. We report here on the environmental storage characteristic (dry air, high humidity, and electrolyte contact) influences on the mechanical properties of Li-ion battery pouch films.

Pouch material (A) exhibited superior tensile properties in all environmental conditions compared with pouch material (B) over a 10 week period. Both film material types displayed little variation in tensile strength when comparing aged vs fresh pouch cell tensile properties. Dry storage conditions proved to give the best tensile strength retention over the testing period, followed by water and electrolyte exposure storage conditions, respectively. Non-negligible negative tensile strength changes were observed over a 10-week testing period.