

Abstract for Lecture at
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Title:
Li-Ion Battery Technologies for next generation Hybrid and Electric Powertrains -
Developments of a Chemical Tier 2 Supplier

Public discussion of global warming and fuel price trends trigger governmental initiatives for CO₂ Reduction and alternative Powertrain incentives. Big global and start up Vehicle Manufacturers and their Suppliers accordingly push the development of next generation low CO₂ Emission powertrains. Depending on target driving cycle and vehicle category new developments focus on parallel and serial Hybrid Electric Powertrains or pure electric Powertrains.

Function, reliability, longevity, safety, packaging, weight and most importantly efficiency of such alternative powertrains depend on the Energy Storage technology applied. The chemistry of Li-Ion battery materials gives highly attractive and promising key data for packaging, weight and efficiency.

The first lecture section details the screening and development of suitable battery materials, cell configurations and first performance test results of 2Ah cells. Cell sizes suitable for HEV and EV application had to be significantly enlarged to reduce complexity of the final vehicle Battery Pack design. The process of scaling up the cell size is shown, giving examples for both Powertrains, HEV and EV.

The second lecture section covers principle design options and selected solutions regarding components and packaging of a typical EV Battery Pack. Fixation, Cooling and Connecting of cells and final battery pack assembly is shown in detail.

The last lecture section describes the lay out, design and development of a complete City EV Powertrain. The initial target list and resulting performance calculation were used match or select market available powertrain components. The final assembly of the Prototype City EV is demonstrated same as first road test results generated. The lecture concludes and discusses gained development experiences. An outlook of future EV Powertrains finalizes the lecture.