

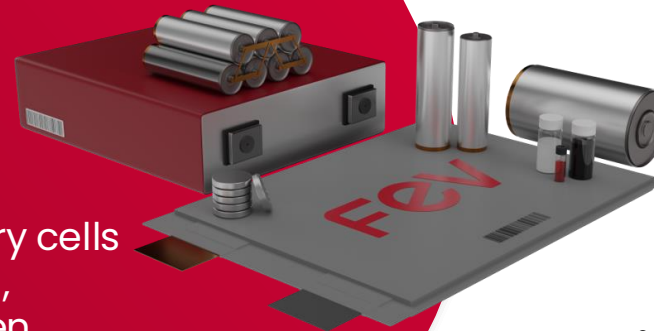
FEV Signature Solutions

Battery cell benchmarking

Comprehensive benchmarking of battery cells in terms of safety, performance as well as the internal structure and material compositions

FEV offers

- Extensive testing and comparison of battery cells (“FEV Scatterbands”) from electrical, aging, safety and material perspective with proven methodology
- Characterization down to the nanometer scale
- Testing of battery cells outside of the safety limits to achieve maximum performance
- Readily available reports for almost all cell types, e.g. NMC, Solid-State, Sodium-Ion



Why FEV


- Holistic view of the battery cell market with close view of the future trends from market and material perspective
- Battery test labs in Aachen, Paris, Munich, Leipzig and Coventry with rapidly expanding test capacities
- Customization of test scope to exactly address customers’ needs guided by FEV’s extensive experience
- Complete picture from cell to pack through FEV test and development capabilities including trade-off analysis between cell and pack optimization
- Comprehensive lifecycle / costs analysis possible as well

Reference projects

BENCHMARKING PROJECTS
ON CELL LEVEL

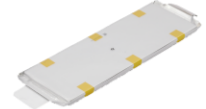
 **SUBLIME**
Sulfide electrolyte with lithium-metal anode

 **ADVAGEN**
Oxide-sulfide hybrid electrolyte with lithium-metal Anode


Teardown and analysis of next-gen cylindrical battery cell

 **NEXTCELL**
Battery cell with gellified liquid Electrolyte


Next-gen cell development support for large OEM

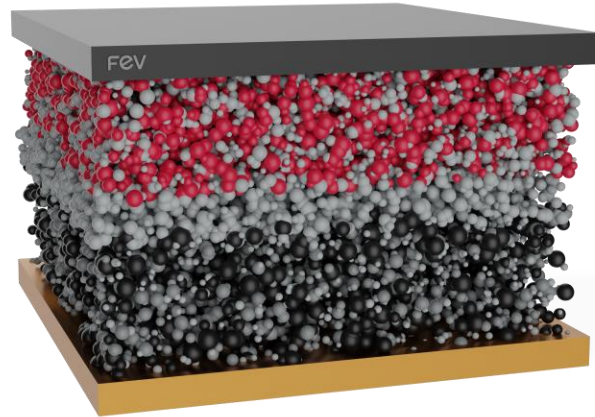

Benchmarking of commercial semi-solid battery cells

- All-solid-state
- Hybrid solid-liquid / semi-solid
- All technologies



FEV's battery cell expertise enables best-in-class battery cell benchmarking with advanced insights and comparison

UPCOMING AND RUNNING BENCHMARKS – BATTERY CELL BENCHMARKING SCOPE



Hyundai Ioniq5
(NMC - pouch)

Volvo EX30
(LFP - prismatic)

Nio ET7 long range
(semi-solid-state)

VW ID.3
(NMC - pouch)

BYD Seal/Dolphin
(LFP - blade)

Seres 5
(semi-solid-state)

Tesla Model Y
(NMC - 21700)

Sehol EX10
(sodium-ion)

Confidential
(semi-solid-state)



Electrical Performance

High-safety climate chambers to test at different temperatures outside the cell operating window enable benchmarking of all types of cells from prototype cells to series production cells



Safety Testing

FEV's unique cell safety testing capability with various trigger possibilities, also for large format battery cells, allows for very precise safety characterisation



Teardown and Benchmarking

Cell opening and teardown to investigate the inner structure. Detailed analysis and benchmarking of the cell components



Material Analysis

Elucidation and evaluation of all cell components to gain insights into the latest trends in terms of cell design and the materials



Small Cell Fabrication

Benchmarking the individual performance of cell components by fabricating coin and small pouch cells using the components extracted from torn-down cells

Get in touch with us for further information



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signature-solutions](http://www.fev.com/en/signature-solutions)