

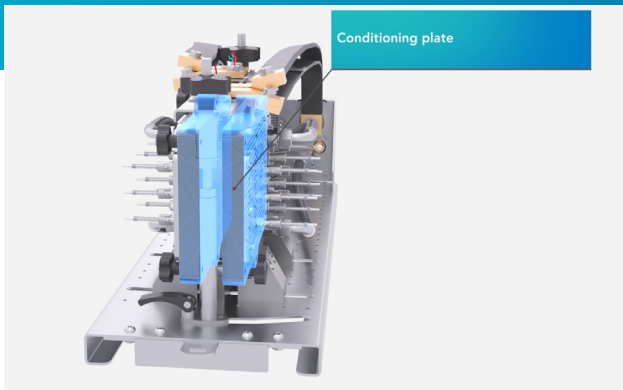
AVL Direct Cooling Technology

Taking battery cell testing to the next level with highly accurate measurements based on direct cooling technology

AVL and the University of Bayreuth are collaborating on a novel battery cell conditioning method for ultra-high precision measurements, ensuring high reproducibility and maintaining a temperature within 0.5 K, forming the basis for UHPC (ultra-high precision coulometry) for R&D purposes.

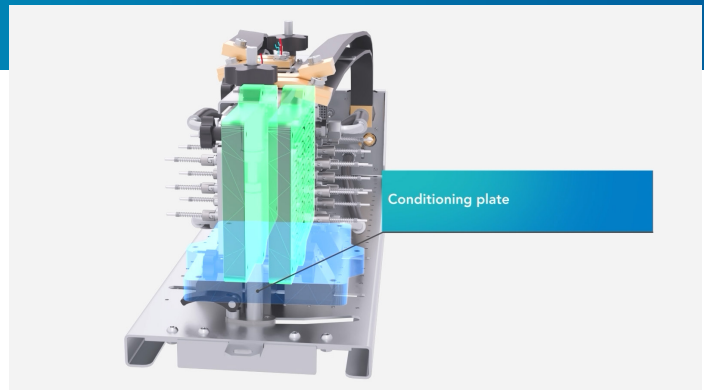
ADDED VALUES

- Set up with AVL BATTERY CELL TS™ Performance Line in combination with AVL Direct Cooling Technology
- Increased current reduces test time
- Direct cooling keeps temperature constant, minimises self-heating influences during testing
- Liquid cooling approach provides highly accurate, highly dynamic temperature control of the battery cell
- Adaptable to different battery cell type (prismatic, pouch or cylindrical) and sizes

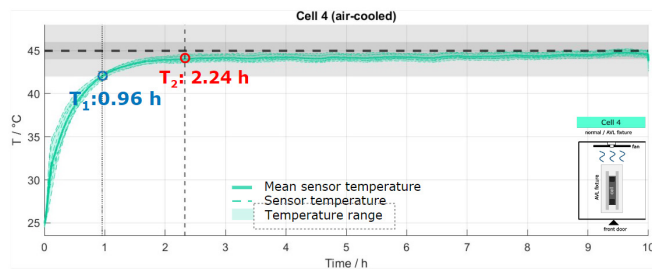


Option One – The Cell Fixture with side conditioning plates enables UHPC measurements due to:

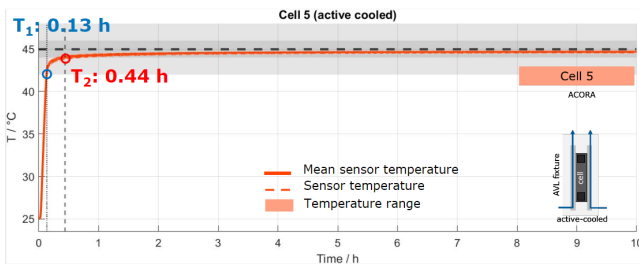
- high thermal stability
- faster temperature changes
- homogeneous temperature distribution



Option Two - The Cell Fixture with bottom conditioning plates is producing earlier test results because the setup closely resembles a future developed battery module or pack, and enables material testing, particularly in terms of heat dissipation.



Example result for air-cooled



Example result for active-cooled

Within AVL's cell test system set-up, liquid-cooled plates can be individually temperature and coolant-flow controlled, to test various scenarios and to validate module or pack development concepts.

The research collaboration investigated the influence of cooling strategies on the outcomes of relevant battery tests, comparing conventional air-cooled systems with actively cooled systems. Overall, the findings indicate that the use of an actively cooled system reduces uncertainties arising from different cell positions and mounting types, as observed in all three tests studied. In the entropy test, it was additionally noted that the time required to adjust to varying cell surface temperatures can be significantly shortened with an active cooling system.

The research collaboration with the University of Bayreuth is based on tests with the AVL Battery Cell TS™ ACORA, where key findings on direct cell cooling show the high potential for accurate and reproducible test results.

For deeper insights into the direct cooling technology, take a look at the **research document**.

