



## Application flyer

# Testing solutions for battery cells and battery components



## Testing of battery cells

The mechanical testing of battery cells is an essential step in the development and quality assurance of battery technologies. These tests are designed to evaluate the structural integrity and mechanical resilience of battery cells to ensure reliable and safe performance.



### Testing system:

- Universal testing machine inspekt 100 kN
- Temperature chamber -40°C bis +120°C with gas sensors for O<sub>2</sub>, H<sub>2</sub>S, SO<sub>2</sub>, CO, H<sub>2</sub>
- Battery charger for regulating the charging status of the battery

### Test procedure:

- Compression tests to simulate the mechanical loads on the battery cells caused by thermal effects and the installation situation
- Analysis of the parameters temperature, state of charge and load

### Safety concept in the test system

#### Temperature chamber with gas sensors:

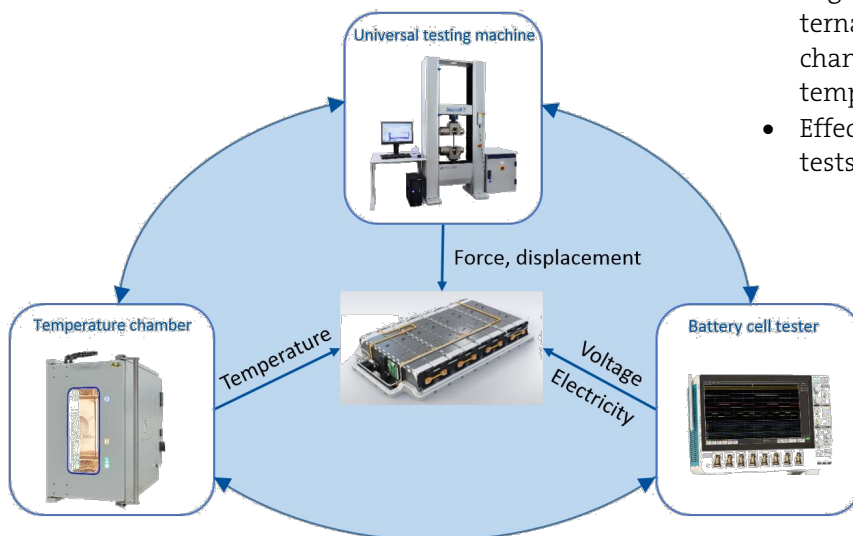
- Status display for information on the atmospheric condition in the temperature chamber
- Pre-alarm and main alarm when defined gas limits are reached
- Automatic system stop and emergency flushing in the event of a main alarm

#### Further safety features of the temperature chamber:

- 5-layer glass and protective grille as splinter protection
- Overload protection and overpressure equalization through pressure relief flap
- Connection to exhaust air system
- Electrical locking of the chamber door

### LabMaster testing software for testing battery cells

- Central control of all system parameters via specially configured block program
- High flexibility in the integration of external sensors: Acquisition of external channels such as cell voltage and cell temperature via analog signal
- Effective data reduction for long-term tests





### Tensile tests on electrode foils



Tensile tests on electrode foils are essential for the development of batteries. They analyze the mechanical properties of the films to ensure that they can withstand the stresses of battery operation. By determining strength, ductility and elasticity, these tests enable the electrode composition to be optimized. The aim is to develop more resistant batteries with improved performance and durability, which is crucial for the electrification of vehicles and renewable energies.

### Puncture tests on electrode foils



Puncture tests on electrode foils are used to analyze how resistant they are to mechanical punctures that could occur during battery operation. By evaluating the puncture resistance, the robustness of the electrode foils can be improved

in order to minimize possible short circuits or power losses. This is of particular importance for the development of safe and efficient batteries in various applications, from electric vehicles to portable electronic devices.

### Peeling devices for peel tests on electrode coatings



Peel tests on electrode coatings are important to evaluate the adhesion and stability of these coatings in batteries. The results of the tests provide important insights into the structural integrity of the coating, which in turn affects the overall performance and reliability of the battery.