

Battery Durability Testing

This part of Millbrook's battery test capability is focused on life testing and functional validation (life, power, internal resistance, BMS functionality etc.) to standards including ISO 12405 and ISO 19453.

Millbrook has over 100 battery cell and 9 battery module and pack test cyclers. It is adding 12 new battery test cells for cycling large automotive battery packs, which will be fully operational in 2019. This will provide a total of 30 pack cycler channels.

Battery test cells (packs):

- 1,100V and up to 500kW per cell (max 750kW with reconfiguration)
- Test area: 26.4m³

Battery cycler:

- 500kW, 1,100V min, 1,400A
- Voltage and current control accuracy $\pm 0.03\% \text{ FS}$
- Can be operated as a single 500kW system or twin 250kW systems operating independent cycles
- Scalable in 250kW steps to 750kW

Environmental chamber:

- W 3.0m x L 4.0m x H 2.2m (26.4m³)
- Operating temperature: -40°C to +90°C
- 3K/min rate of cooling and heating
- Humidity controllable from 10% to 95% r.h. from +5°C to +85°C
- EUCAR Hazard Level 6

Battery conditioning:

- Operating temperature: -45°C to +125°C
- Control accuracy $\pm 1^\circ\text{C}$
- 8kW heating power
- 9kW cooling power
- 40ltrs/min fluid flow rate



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Millbrook routinely tests Li-ion cells, modules, packs and vehicles (class M1-M3 and N1-N3) and will consider other chemistries including Lithium-metal.

Automation:

- Millbrook Revolutionary Engineering's REPS cell automation software
- Software allows tests to be configured to customer requirements (including real-time interactions with the packs BMS)
- Extensive logging capabilities and almost unlimited storage

Data acquisition:

- Up to 100 data channels, including a range of:
 - Voltage
 - Current
 - Temperature
 - Pressure
 - Flow

Remote access:

- Secure staff and customer access to details of running tests
- Secure communication between test facilities: data stream, camera and video conferencing

Connectivity:

- Palletisation of battery test trolley to allow test preparation outside the test cell to include:
 - Instrumentation
 - Fluid
 - HV
 - LV / CAN

