

MAHLE Powertrain Battery Pack Testing

- > Dedicated battery development facility
- Replicating real-world conditions
- Testing in extreme environments

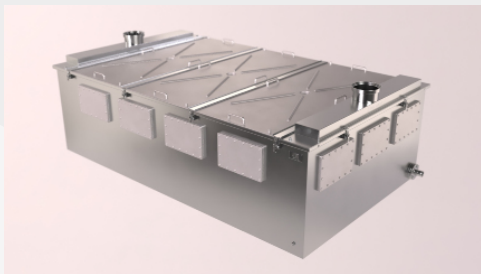


Battery Pack Testing

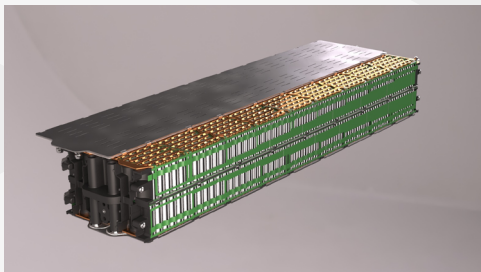
MAHLE Powertrain provides extensive capabilities for battery engineering with a range of dedicated facilities to support the design, simulation and development of cells, modules and complete battery packs.

Our new 275m² facility incorporates climatic test chambers for pack development and validation testing. This latest investment adds to our portfolio of electrical test capability giving a total of 1.25 MW electrical power across six separate rigs and chambers. Innovative new features, designed in-house, are included within the battery test chambers to increase flexibility.

The test environment can be precisely controlled to mimic a variety of real-world conditions in temperature controlled environments. This new facility supplements our existing cell and module test and characterisation capabilities. This state-of-the-art facility lies at the heart of our turnkey, end-to-end battery development process, through which we provide an extensive range of battery engineering services to our customers.



>> Battery pack testing tank



>> In-house designed battery module

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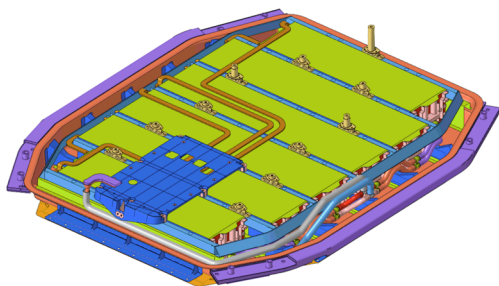
MAHLE Powertrain Battery Testing

Key customer benefits:

Highly versatile - The only commercially available 1MW battery test chamber in the UK, making it suitable for a wide range of applications from on/off highway, industrial to marine applications

Reduced risk - The unique rapid response capabilities of the test chambers mitigate the risk of thermal events during early prototype phases

Faster to market - A "one stop shop" using our battery engineering team to support analysis, design and development in the facility streamlines and simplifies the product development process for customers



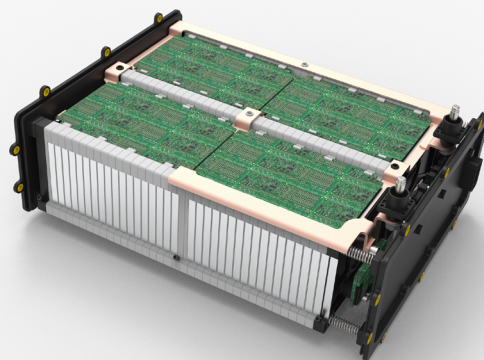
>> Battery pack analysis model

BDC Capabilities

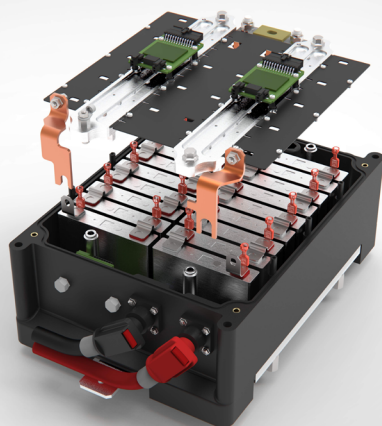
Max battery pack size:	2500 x 1600 x 500 mm
Max pack test current:	2400A
Max pack test power:	1 MW
Test temperature range:	- 40°C to + 60°C
Humidity control:	10% - 95%
Safety specification:	Eucar hazard level 6

Typical Programs and Services

- Performance evaluation
- Charging / discharging at extreme rates
- Automated aging & real world cycles
- Battery cooling system optimisation
- Cell characterisation
- Pack verification



>> Lithium-carbon battery



>> 48 V battery pack

Summary

Our new facility investment is part of a larger EV development strategy to address the automotive industry's need for more focused battery development capabilities. From the real-world testing and strip-down of battery modules to battery pack build, test, simulation and analysis, we cover the entire EV battery development process to further aid EV battery optimisation, focusing on the advanced understanding of battery architectures, control systems, charge rates and thermal management.

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