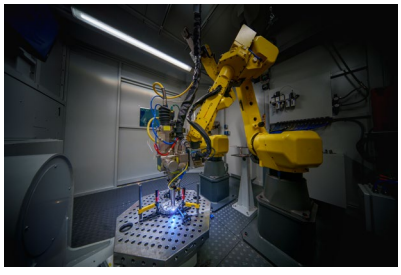
MAHLE Powertrain

Battery Development Centre

Battery Development Centre (BDC)

Battery testing tank



Laser welding

Dedicated battery development facility

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 facilities in both the UK and Germany incorporate 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 MW electrical power across four 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 and humidity 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.

Typical Programs and Services

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

Replicating real-world conditions
Testing in extreme environments

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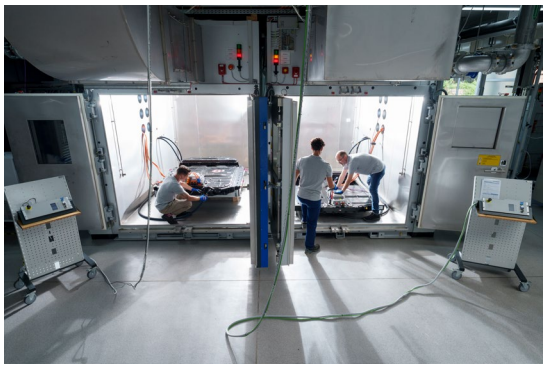
MAHLE Powertrain 01/2024

MAHLE Powertrain

Key Customer Benefits

Highly versatile	- Testing up to 1MW battery 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	- Our complete battery development process using our battery engineering team to support battery development from concept right through to production.

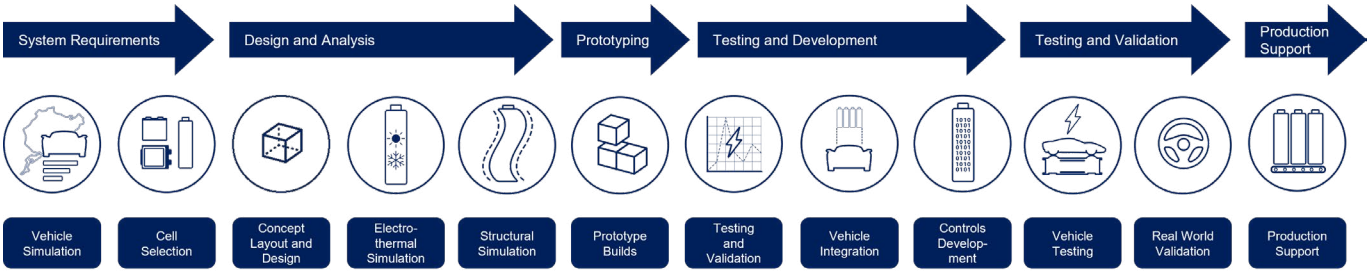
BDC Capabilities	
Max battery pack size:	2500 x 1600 x 500 mm
Max pack test current:	2400A
Max pack test power:	1 MW
Test temperature range:	- 40°C to + 90°C
Humidity control:	10% - 95%
Safety specification:	Eucar hazard level 6



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.

Prototype / low-volume build



Battery development process and capabilities

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