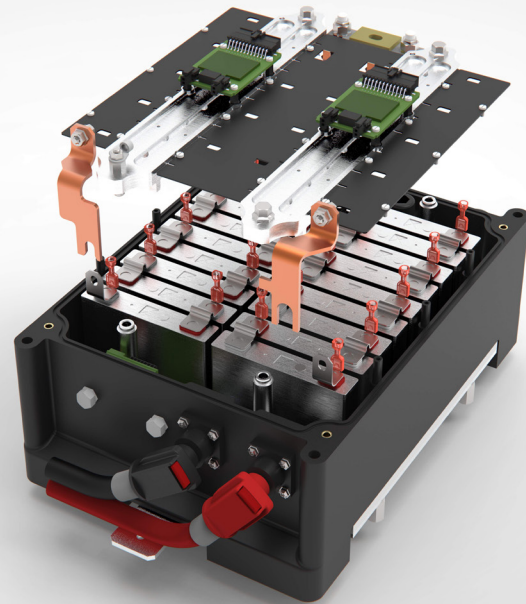


MAHLE Powertrain High Charge Rate 48 V Battery Pack



20 kW peak charging capability

High efficiency cooling system

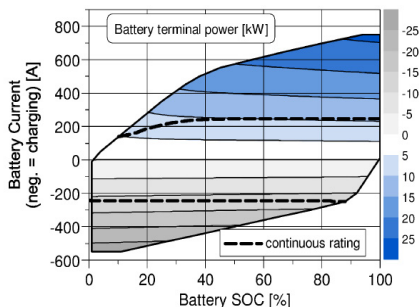
0.5 kWh capacity

48 V Battery Pack

48 V mild hybridisation has become an attractive and commercially viable option due to significant savings in weight, package space and cost compared to high voltage alternatives. The safety considerations for vehicle maintenance are also a key factor in the adoption of 48 V architectures.

For maximum benefits, high power capability is required for maximised recuperation during deceleration events in order to maximise capture of the braking energy available. The cost and installation package can be reduced by minimizing the storage capacity of the 48 V battery. These conflicting requirements lead to a small battery pack capable of repeated high-power charge and discharge events.

Analysis for a typical C-segment vehicle suggests that a charging capability of 20 kW enables the majority of available braking energy to be recovered. Power deployment at the next acceleration event following a recuperation cycle is an effective control strategy; therefore only a modest electrical storage capacity is required.



>> Charging and discharging power map targets

MAHLE Powertrain 48 V Battery Pack

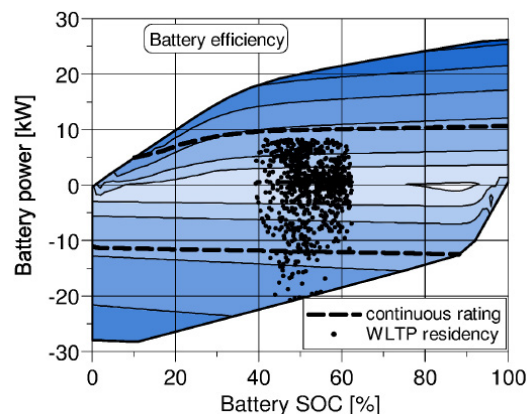
Benefits

- 0.5 kWh, 48 V Battery pack
 - › Designed to address electrification challenges
 - › High power cells enable high charge & discharge rates
- Chemistry avoids danger of thermal runaway
- High cycle life > 20,000 cycles
- Optimised cooling system
 - › Cell temperature maintained below 55°C
 - › Minimal complexity
- Bus bar design avoids additional heat input into cell terminals
- Capable of 10 kW continuous charging & discharging power
 - › Peak performance of 20 kW
 - › Suitable for any MHEV architecture from P0 to P4
- Optimised strategy keeps operating points of battery in highly efficient areas during the WLTP test
- 15% FE benefit
 - › Possible in a C-segment vehicle with P4 hybrid configuration

Summary

MAHLE Powertrain's new, in-house designed 48 V battery pack has been conceived to provide repeated charging and discharging at these high power rates to maximise the potential for energy recuperation during deceleration and braking events.

This compact battery pack will offer significant opportunities for 48 V mild hybridisation and is capable of supporting any MHEV architecture from P0 to P4.



>> Operating strategy ensures good control of SOC during WLTP

Specifications

Technical Data

Voltage level:	48 V
Voltage range:	36 - 52 V
Capacity:	0.5 kWh
Continuous charge/discharge power:	10 kW
Peak charge/discharge power:	20 kW
Dimensions:	Length - 420 mm Width - 270 mm Height - 237 mm
Temperature Range:	-20°C to + 55°C



>> 48 V battery

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