



WHITE PAPER

# Acting upon regulation GB38031-2025

“No Fire – No Explosion”

# Management Summary

With the updated battery safety regulation GB38031-2025, China's MIIT raises customer-centric safety requirements for battery electric vehicles to the global leading level.

OEMs must comply by July 2026 for new vehicle launches and July 2027 for existing ones – noncompliance blocks market access. This puts both existing, and future programmes in China under severe pressure – adding to the market headwind and severed cost pressure European players are facing already on the world's leading electric vehicle market.

H&Z and AVL partner to enable automotive players to act upon the updated regulation: Assessing the status quo of compliance, defining measures to achieve compliance and evaluating the strategic, and commercial impacts. Together, we enable automotive companies to set up and run impactful regulation taskforces within weeks.



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In cooperation with H&Z Management Consulting

# Introduction

## China's Updated Battery Safety Regulation GB38031-2025 sets a New Global Benchmark, meaning Urgent Strategic Assessment is Required

China's MIIT has introduced GB38031-2025, a groundbreaking update to the EV battery safety regulation. It will be effective with July 2026 for new approvals and July 2027 for existing ones. It is the first to mandate, that batteries must not emit flames indefinitely after cell failure detection. Additional tests for bottom intrusion and cell-level, including post-fast-charge aging safety tests increase the safety requirements considerably.

Legacy systems face major technical and financial hurdles to comply, with re-homologation efforts and potential cost increases threatening competitiveness. OEMs must now choose between phasing out current systems, launching new generations, or retrofitting existing designs.

Global relevance is rising, as similar regulatory updates are expected to follow in Europe (e.g., ECE R100 v5). To support strategic decision-making, H&Z partners with AVL to provide a focused techno-economic compliance assessment.



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# Updated GB38031-2025

**Starting in July 2026, China will enforce the updated GB38031-2025 – a landmark safety regulation for electric vehicle batteries.**

For the first time worldwide, it requires that batteries must not catch fire or explode, even in the event of a thermal runaway. This marks a shift from enabling safe evacuation to enforcing absolute safety under critical conditions.



## Core Technical Elements

**The regulation introduces new and more rigorous test procedures:**

- **Thermal diffusion test (cell level):**  
No fire or explosion observed for a minimum of 2 hours after thermal runaway, and no visible smoke in the cabin.
- **Bottom impact test (pack level):**  
Evaluates protection against underbody impacts such as road debris or collision.
- **Fast-charging cycle safety test:**  
Batteries must remain safe during a short-circuit test even after 300 fast-charging cycles. These technical requirements will likely require significant changes in battery design, validation processes, and material selection.

## Strategic Challenge

- **OEMs must prepare for mandatory compliance deadlines:**
  - New type approvals: July 1, 2026
  - Existing vehicles (rehomologation): July 1, 2027
- **This creates a dual pressure:**
  - Technical: Quick yet robust adaptations of existing battery platforms.
  - Economic: Balancing cost, development effort, and time-to-market

Failure to comply could result in loss of access to the Chinese EV market, making fast and well-informed strategic decisions critical.



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# Test Requirements

■ Minor Change   ■ No Change   ■ New

Group	Item	Group	Item
Cell Tests (7 items)	Over-discharge	Pack or System Tests (17 items) (1/2)	Water immersion
	Over-charge		External fire
	External short circuit		Thermal propagation
	Temperature cycling		Thermal shock
	Crush		Salt spray
	Fast-charge cycle safety		High altitude
	Vibration		Over-current protection
Pack or System Tests (17 items) (1/2)	Mechanical shock		Over-temperature protection
	Simulates crash		External short-circuit protection
	Crush		Over-charge protection
	Humid heat cycling		Over-discharge protection
			Bottom impact

The updated regulation represents a significant overhaul compared to the current GB38031-2020 standard. Several requirements have been tightened or newly introduced—particularly regarding fire safety and mechanical robustness after cell failure or fast charging events.

These changes are expected to have an impact beyond the Chinese market. Key elements of GB38031-2025 will likely be proposed for global harmonization and inclusion in the upcoming UN ECE R100 Revision 5, planned for 2027. As such, the regulation is set to become not just a national benchmark, but a potential global reference for battery safety.

See deep dives into the newly introduced test requirements on the next pages



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# Deep Dive Thermal Propagation



## FEATURES

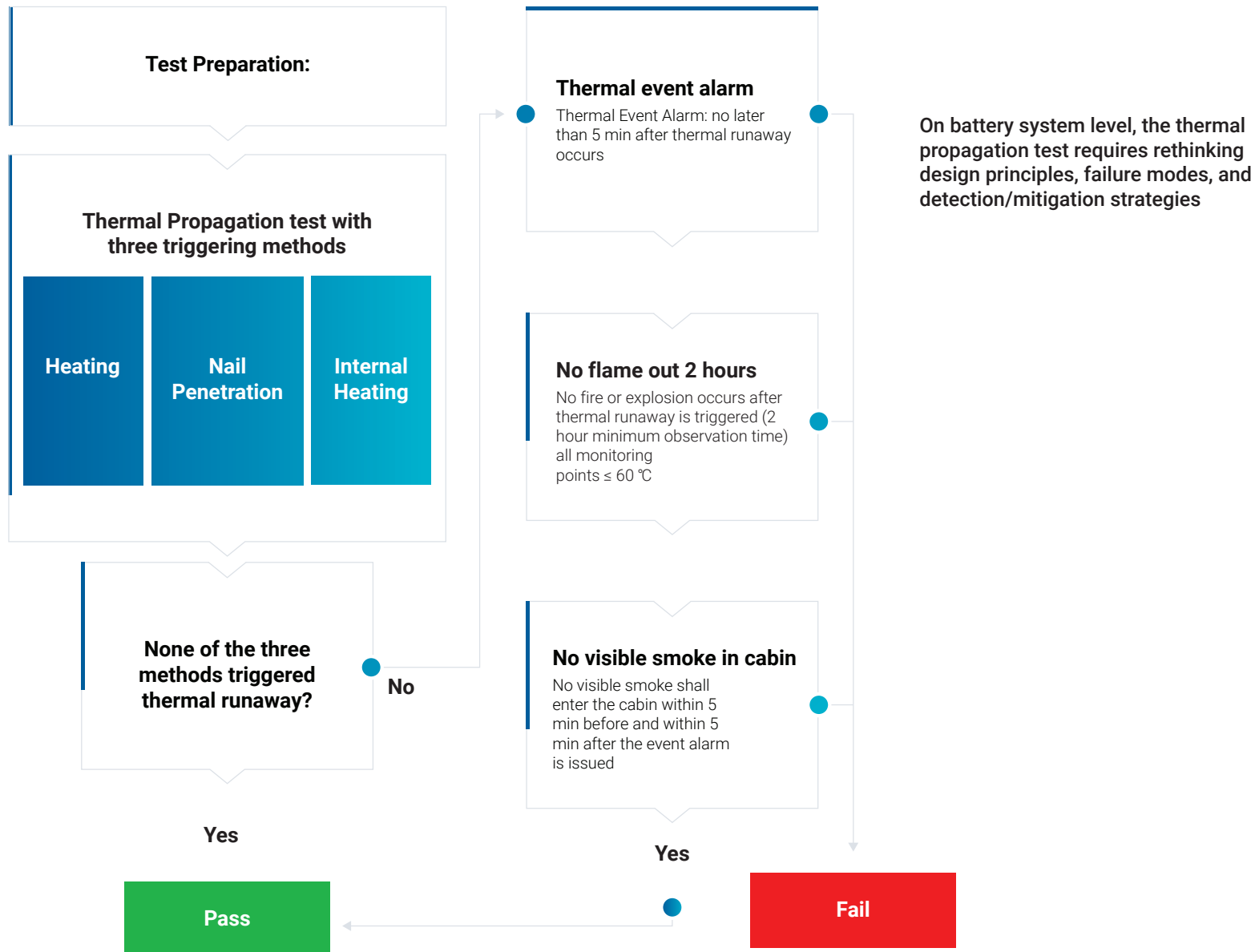
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# Deep Dive Bottom Impact

In the new bottom impact test, requirements for the battery's structure and thermal system are raised considerably

- **Objective:**

Assessing battery protection after impact on bottom This test evaluates structural integrity against underbody impacts from road debris or collisions.

- **Test Object**

Battery Pack

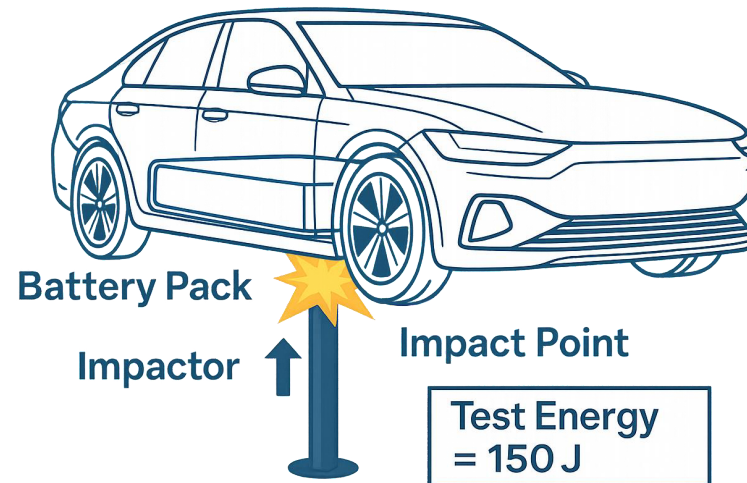


- **Testing Method:**

SOC to  $\geq 95\%$  (externally chargeable) or  $\geq 90\%$  (vehicle-charged only) Impactor diameter 30 mm, 150 J energy, three repeated impacts.

- **Technical Requirement:**

No leakage, rupture, fire or explosion, and meet insulation resistance requirements.



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# Deep Dive Fast-Charge Cycle Safety Test



## Objective

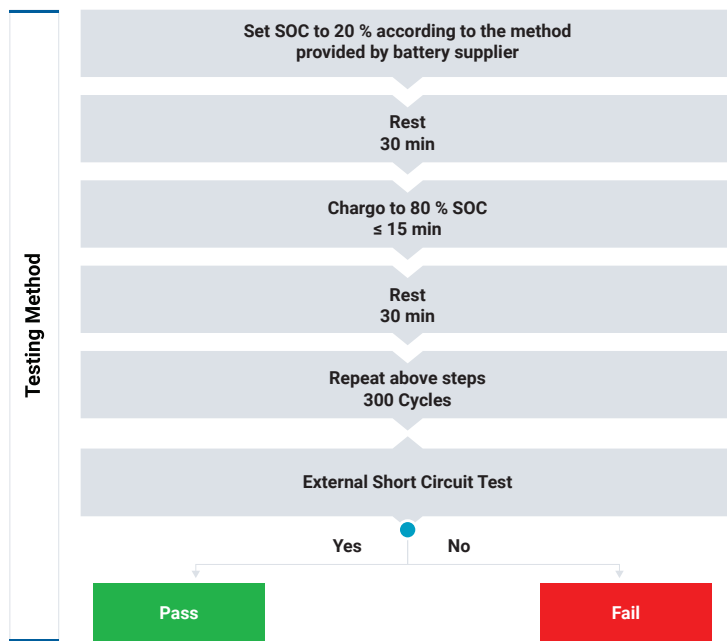
- The test addresses safety risks from repeated DC fast charging, which can cause lithium plating and accelerate battery degradation.
- Verify long-term safety of batteries after 300 fast-charge cycles and evaluate risks of thermal runaway post-degradation.

## Test Subject

- Externally rechargeable battery cells (20 - 80% SOC in  $\leq 15$  min).
- External short circuit: Identical to new cell testing procedures. Connect the positive and negative terminals with an external resistor of 5 m $\Omega$  or less for 10 minutes.

## Pass Criteria

- No fire or explosion is allowed during the external short-circuit test following 300 fast-charge cycles.



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# Project Approach to prepare Compliance Taskforce



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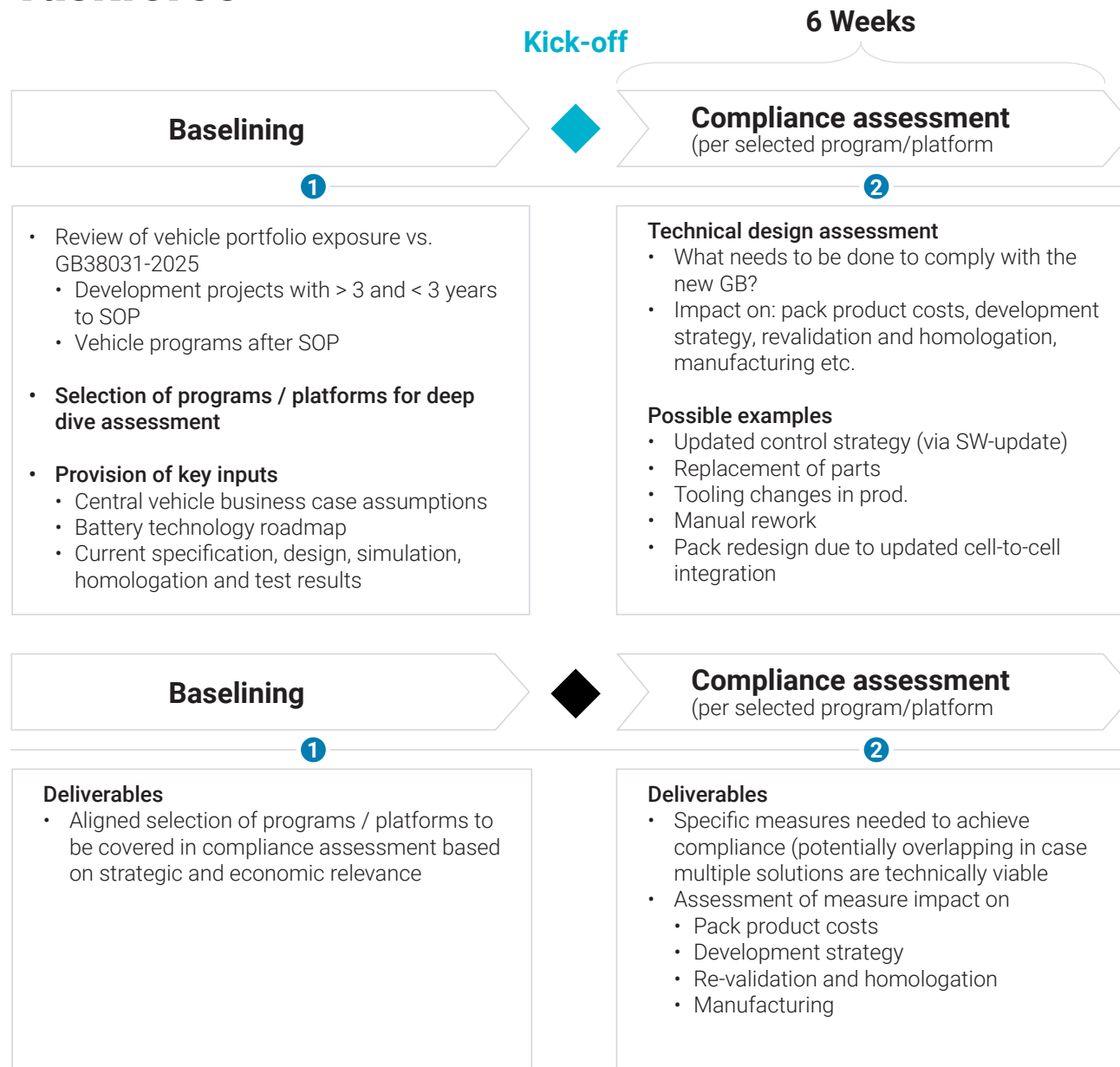
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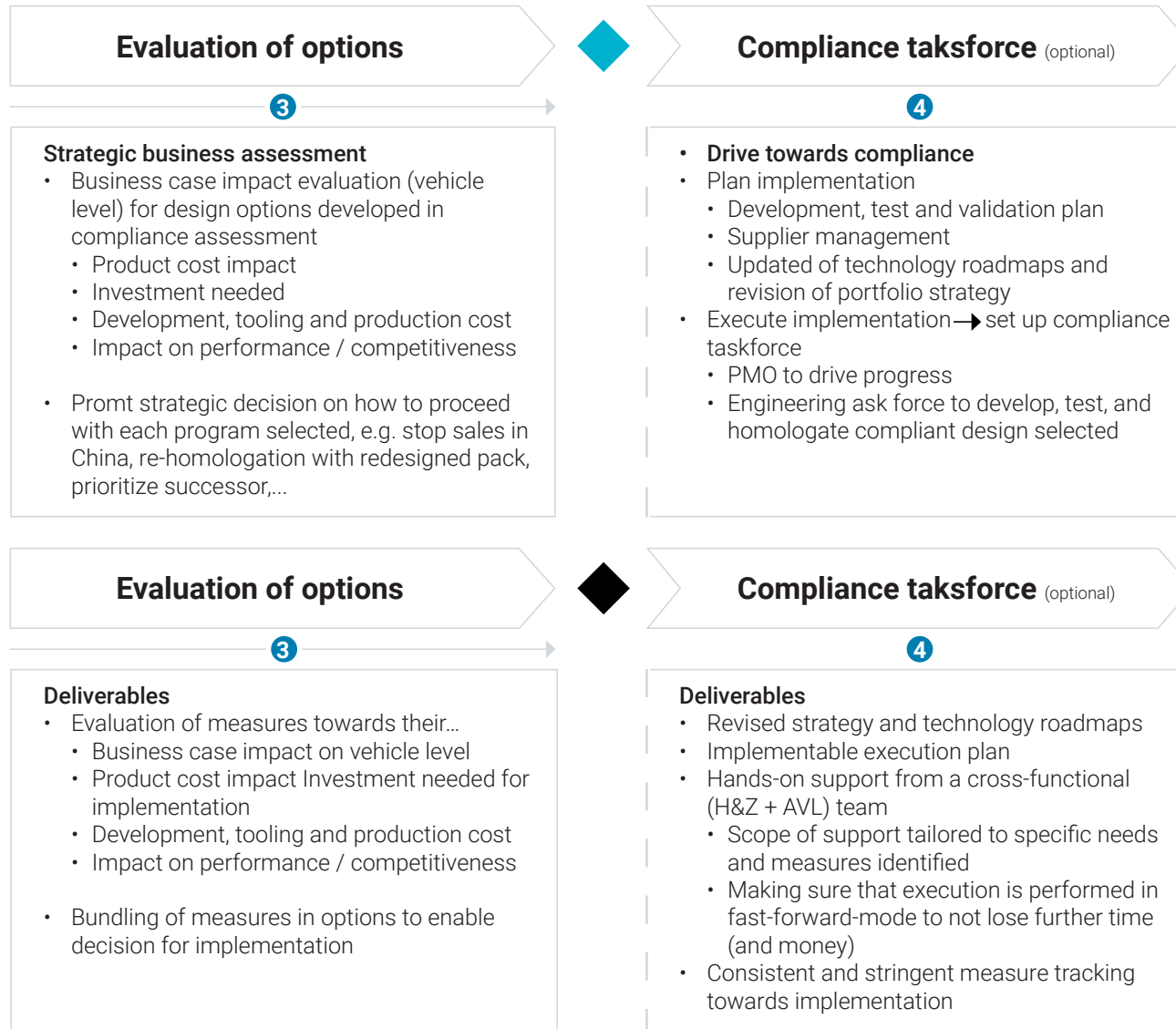
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# Deliverables



## Decision



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# H&Z and AVL Partnership

## Automotive Strategy Experts

- Established management consulting firm with an experienced automotive-focused team - dedicated to innovation & technology
- Comprehensive service portfolio along the entire product life cycle, geared towards circular value chains
- Industry-leading track record in purchasing
- Suite of proprietary databases and tools around automotive batteries, e.g.:
  - Gigafactory supply database and multi-industry demand model
  - Cell chemistry to application fit models



## Battery Development Experts

- AVL is one of the world's leading mobility technology companies for development, simulation and testing in the automotive industry and other industries
- 11 % in-house R&D quota
- 12,200 employees, ~650 engineers engaged in battery-related projects (incl. SOP responsibility)
- In-house battery innovation centre
- In-house cost engineering team capable of battery cell tear downs and calculations (references included)
- Thermal propagation benchmark report on leading BEVs, including the most recent designs from China



## Unique automotive battery excellence

**H&Z and AVL combine long-standing industry and technology experience as one partner to deliver the techno-commercial advice decision makers need.**

An experienced project team linking management consulting and technology, capable of delivering impactful analysis and actionable recommendations for compliance with the updated GB38031-2025



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# Ready to drive compliance in China?

Your contacts to take the next step



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