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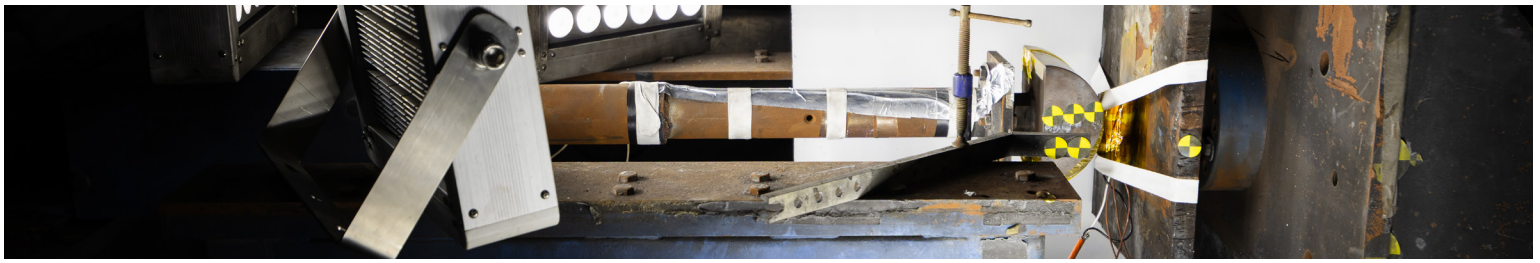
Battery Testing Services

www.mgaresearch.com/capabilities



Battery Abuse: Mechanical & Electrical

Mechanical

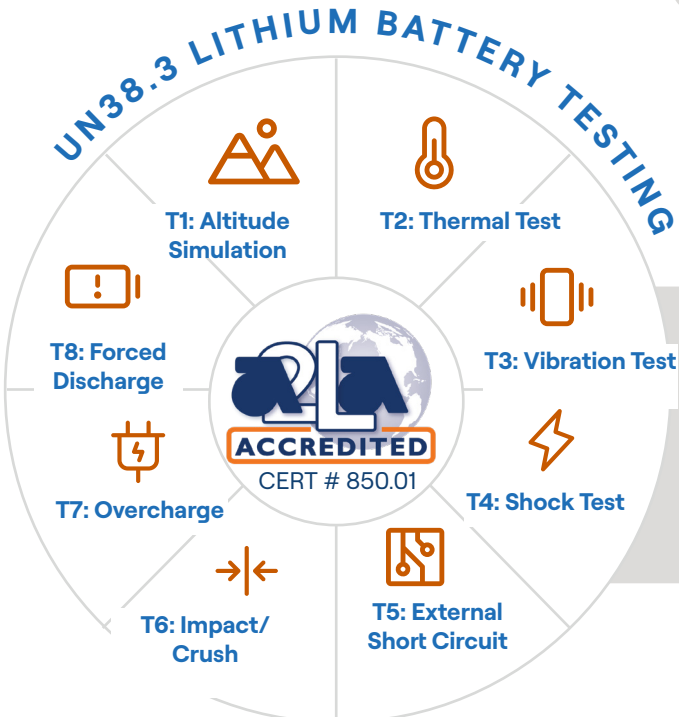
- Crush
- Nail Penetration
- Vibration
- Freefall Drop
- Mechanical Shock
- Rotation
- MAST Vibration

Mechanical shock testing helps evaluate how a component responds to sudden, forceful impacts that mimic real-world scenarios such as drops, impacts, collisions, or abrupt movements. For example, in automotive applications, these tests could simulate the impact of potholes, or handling drops during assembly, and shipment. These tests are essential for identifying potential failures that could lead to decreased performance or loss of function.

Electrical

- Overcharge
- Forced/Over Discharge
- External Short Circuit

MGA utilizes a network of three battery teset facilities that perform abuse testing from the cell level up to packs and full vehicles. Equipped with advanced battery abuse testing facilities and equipment, MGA offers a variety of capabilities. Common test specifications are UN 38.3, ECE R100, SAE J2929, and KMVSS 305A. With over 20 years of experience in battery and EV testing, our team delivers expertise and comprehensive solutions to meet the evolving needs of our customers.



UN38.3 battery testing refers to a series of rigorous safety tests required by the United Nations for lithium batteries to ensure they can be safely transported, particularly by air. MGA's test facilities are ISO 17025 accredited for UN38.3 testing.

Environmental & Performance

Testing Capabilities

- Thermal Cycling Exposure
- Altitude Simulation
- Immersion
- Humidity
- Salt Spray
- Dust Exposure
- Capacity Checks
- Hybrid Pulse Power Characterization (HPPC)
- High- and Low-Temperature Operation (HTOE and LTOE)
- RPT Testing
- Cycle Life Testing

FMVSS 305A

This regulation applies to EV vehicles, establishing performance and risk standards for propulsion batteries. Capabilities include:

- Overcharge
- Over-discharge
- Overcurrent
- Over-temperature
- External Short Circuit
- Water Exposure Safety
- Documentation for low temperature and operational failures of vehicle control warnings

FMVSS 305a: S12 Vehicle Controls for Safe REESS Operations Test Methods	
S12.1 Over-charge	Attempt to provide charge to battery after it is already fully charged
S12.2 Over-discharge	Attempt to provide a lead on battery after it is already fully discharged
S12.3 Overcurrent	Attempt to provide additional charge current to battery beyond its specified rating
S12.4 Over-temperature	Attempt to raise the temperature of battery beyond its specifications through normal operation
S12.5 External Short Circuit	Create a short circuit in electrical system outside of battery

ECE R100: Battery Testing Methods	
Vibration	Simulates the vibrations a battery may experience during vehicle operation
Mechanical Shock	Subjects the battery to mechanical shocks to simulate impacts, ensuring it remains safe and functional after severe jolts
Thermal Shock and Cycling	Exposes the battery to extreme temperature changes to evaluate its ability to withstand thermal stress without degradation or failure
External Short Circuit	Tests the battery's safety by intentionally short-circuiting
Overcharge Protection	Assesses the battery's ability to handle overcharging conditions without resulting in hazardous events like thermal runaway
Over-discharge Protection	Evaluates the battery's performance and safety when over-discharged, preventing cell damage or unsafe conditions
Mechanical Integrity	Verifies the safety performance of the REESS under contact loads which may occur during vehicle crash situation
Over Temperature Protection	Verifies the performance of the protection measures of the REESS against internal overheating during the operation
Over Current Protection	Verifies the performance of the overcurrent protection during DC external charging to prevent the REESS from any severe events caused by excessive levels of charge current as specified by the manufacturer
Fire Resistance	Exposes the battery to direct flames to assess its ability to resist external fire propagation

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About MGA

At MGA Research Corporation, we're more than just a world leader in testing services—we're your dedicated partner in ensuring the highest quality for your products. Our labs serve as a comprehensive hub where we meticulously evaluate any aspect of your product, from the raw material to the final assembly. With over 45 years of diverse testing experience in safety, durability, and material performance, we bring a wealth of expertise to address your unique challenges. We are here to offer tailored technical solutions that meet your specific needs.

Get in touch

www.mgaresearch.com
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