

Battery Safety Testing 2026: Standards & Test-Line Brief

GB 38031-2025 · UL 9540A Ed.6 / NFPA 855 · EU Battery Regulation 2023/1542

Table 1. The three 2026 battery safety and compliance regimes compared.

Region / instrument	Scope	Key new requirement	Effective
China — GB 38031-2025	EV traction batteries	No fire/explosion ≥2 h after internal-short thermal runaway; alarm ≤5 min; points <60°C; bottom impact 30 mm/150 J×3; 300 fast-charge cycles + short	1 Jul 2026
USA — UL 9540A Ed.6 + NFPA 855 (2026)	Stationary BESS	Large-scale fire test proving non-propagation between units; deflagration & gas-hazard evaluation; aligns with NFPA 855 Annex G.11	Ed.6 pub. 13 Mar 2026; eff. Jan 2027
EU — Battery Reg. (EU) 2023/1542	All batteries to the EU	CF declarations (>2 kWh industrial from 18 Feb 2026); labels + QR Aug 2026; digital passport Feb 2027; due diligence Aug 2027	Phased 2025–2027

China: GB 38031-2025

Issued 28 March 2025 and compulsory from 1 July 2026, GB 38031-2025 replaces the 2020 edition and is widely described as the strictest EV battery safety standard yet. It raises the thermal-propagation requirement from a five-minute pre-fire alarm to no fire and no explosion for at least a two-hour observation period after an internal-short thermal event, while still requiring an alarm within five minutes and keeping all monitored points below 60 °C.

The standard contains 7 cell-level and 17 pack/system-level tests. New additions include a bottom-impact test (30 mm striker, 150 J, three impacts) and a fast-charge cycle safety test (300 cycles plus external short). An internal-heating-plate trigger is added alongside nail penetration and external heating. CATL was first to certify; Sunwoda, Gotion and CALB have announced compliance.

United States: UL 9540A 6th Edition

Published 13 March 2026 and effective January 2027, UL 9540A Ed.6 folds a large-scale fire test (LSFT) into the national BESS test method (Section 10), requiring demonstration that thermal runaway in one unit does not propagate to adjacent units. A new Annex C adds a large-scale deflagration test for enclosures, and the edition strengthens hydrogen/hydrocarbon gas-accumulation measurement. It tightens alignment with the 2026 edition of NFPA 855 (Annex G.11). UL 9540A is a test method, not a certification; its report is the evidence AHJs require under NFPA 855 and the IFC.

European Union: Battery Regulation 2023/1542

Replacing the 2006 Batteries Directive on 18 August 2025, the EU regime adds sustainability and traceability duties. Carbon-footprint declarations for rechargeable industrial batteries above 2 kWh became mandatory on 18 February 2026; from 18 August 2026 batteries need visible labels and QR codes with capacity and minimum lifetime; from 18 February 2027 the digital battery passport is mandatory for EV, LMT and industrial batteries above 2 kWh; and supply-chain due diligence (cobalt, lithium, nickel, natural graphite) for operators above €40 m net turnover was postponed to 18 August 2027.

Six Test-Line Capabilities to Spec in 2026

- Thermal-propagation chambers with per-cell temperature/voltage instrumentation for the two-hour, sub-60 °C observation.
- Internal-heating trigger rigs, in addition to nail-penetration and external-heating stations.
- Bottom-impact and mechanical-abuse stations (150 J, three-strike underbody test).
- Fast-charge cycling plus external-short cells, folding formation into the safety scope.
- Gas-analysis and heat-release-rate calorimetry for UL 9540A Ed.6 LSFT and deflagration work.
- Structured, per-serial data export (barcode/RFID, recipe, results) for EU passport and audit readiness.

About NEGUP MACHINE

NEGUP MACHINE (Huizhou Negup New Energy Equipment Co., Ltd.) builds battery assembly and testing equipment — assembly lines, assembly equipment and testing equipment for cylindrical, prismatic and pouch cells, modules and packs. This brief is informational; figures are drawn from MIIT/SAMR, UL Solutions, NFPA and the Official Journal of the EU. Contact: WhatsApp +86 153 0769 0902 · rain@negupgroup.com · www.negupmachine.com.