National standards take effect on July 1st! A 0.5% weight loss threshold and a 500Wh/kg minimum will eliminate 30% of small and medium-sized enterprises? Will this reshuffle the solid-state battery industry leave small and medium-sized manufacturers with no way out?

2026 is widely recognized in the industry as a key turning point for the industrialization of solid-state batteries. And July 1st is a crucial test day for the entire industry – the world's first national standard for solid-state batteries for vehicles, GB/T 43568-2026 **"Solid-state batteries for electric vehicles Part 1: Terminology and classification",** will **officially come into effect** .This is not just an ordinary standard update, but an **industry-wide "sifting through the false to find the true"** : ending years of conceptual chaos with clear, quantifiable indicators, and reshaping the industry landscape with unified security and performance thresholds. Leading companies can comfortably deploy their technological, production capacity, and financial advantages, while a large number of small and medium-sized manufacturers face the harsh reality of **"meeting the standards means financial loss, failing to meet the standards means elimination."**With a 0.5% weight loss rate threshold set, **30% of small and medium-sized enterprises** may be eliminated; the stringent energy density target of 500Wh/kg is looming, and industry concentration is expected to rise to over 80%. Is the solid-state battery sector truly about to become a "one-man show" for giants?

Part 01

The core content of the national standard: three hard indicators to cut off the confusion of concepts.
This national standard for solid-state batteries was spearheaded by **the National Automotive Standardization Technical Committee** and led by the China Automotive Technology and Research Center (CATARC). A draft for public comment was completed in December 2025, it was formally submitted for approval in April 2026, and will be mandatory on July 1st. As **the world's first** solid-state battery standard specifically for automotive applications, its core objective is singular: **to define true solid-state batteries and eliminate pseudo-solid-state batteries** .

1. Classification and characterization: The "semi-solid-state" category is abolished, and only three types of batteries are classified.The national standard clearly classifies power batteries into three categories, completely eliminating vague terms such as "semi-solid," "quasi-solid," and "quasi-solid."

- **Liquid batteries:** Liquid electrolyte content > 20%
- **Hybrid solid-liquid batteries:** liquid electrolyte content 5%–20% (formerly "semi-solid")
- **All-solid-state batteries:** liquid electrolyte content <5%, and ion conduction is achieved entirely through solid electrolyte.

This means that many products that companies have packaged as "solid-state" in the past few years are actually just **hybrid solid-liquid batteries** , and the term "solid-state" will no longer be allowed in their advertising after July.

2. Core criterion: Weight loss ≤ 0.5% after 6 hours in a vacuum at 120℃.This is **the most critical and unavoidable** hard indicator in the national standard:

- Test conditions: Baking at 120℃ under vacuum for 6 hours
- Meeting the standard: Mass loss rate ≤ 0.5%, and no visible liquid leakage.

The standard drafting group, in conjunction with eight institutions, conducted field tests on 17 mainstream products to verify their performance.

- True solid-state batteries: weight loss rate generally <0.3%, easily meeting the standard.
- Hybrid solid-liquid batteries (formerly semi-solid): weight loss rate 1.68%–10.33%, all of which fail to meet requirements.

The 0.5% threshold directly squeezes out the "water" from solid-state batteries.

3. Performance Thresholds: Safety and Energy Density Both Meet Standards

- **Safety baseline** : All-solid-state batteries must pass rigorous tests such as needle penetration, extrusion, high temperature, and immersion to achieve zero fire and zero explosion.
- **Energy density** :

Hybrid solid-liquid battery: ≥ 400Wh/kgAll-solid-state battery: ≥ 500Wh/kgCompared to the current mainstream liquid ternary batteries (260–280Wh/kg), the national standard directly raises the performance threshold by 80%–100%.

Part 02

Why are national standards considered a "lifeline for small and medium-sized manufacturers"? Three major pressures remain unresolved.
For leading companies like CATL and BYD, the national standard is **a moat** ; for small and medium-sized manufacturers, it's **a death sentence** . Industry research shows that about **30% of small and medium-sized battery manufacturers** will **be forced to exit the market due to their inability to meet the standards** , with the core pressure concentrated in three aspects.

1. Technological Gap: A 0.5% weight loss rate is the "ceiling" of the process.To achieve **a weight loss rate of ≤0.5%** , two major technical challenges must be solved:

- **Electrolyte ultra-thin coating:** The thickness needs to be controlled within 3 micrometers, otherwise the yield rate will drop by more than 15%;
- **Interface impedance control:** Insufficient contact area at the solid-solid interface can easily lead to local overheating, affecting the pass rate of safety tests.

Leading companies like CATL have already achieved an energy density of 400Wh/kg in pilot production lines using sulfide-based batteries, and their condensed-state batteries have reached 500Wh/kg, which they have supplied to NIO's ET9. Meanwhile, most small and medium-sized manufacturers are still at the stage of mixed solid-liquid batteries with a liquid content of 10%–20%, representing a technological gap of at least 3–5 years.

2. Funding Black Hole: Production line upgrades + R&D investment, starting at least 500 million yuan.The head of a small-to-medium-sized battery manufacturer in central China openly admitted that the "solid-state battery" previously advertised by the company actually contains 30% liquid electrolyte. To meet the standard, **the production line upgrade alone would require an investment of over 500 million yuan** , and the current cash flow is insufficient to support this, so the company has no choice but to exit the market.The financial pressure brought about by the implementation of national standards mainly includes:

- **Production line restructuring:** Traditional liquid production lines cannot be adapted to new processes such as dry electrodes and high-density pressing, and the cost of modification or reconstruction is 300-800 million yuan;
- **Research and development breakthroughs:** Continuous investment in electrolyte materials, interface modification, yield improvement, etc., with an average annual R&D expenditure of no less than 100 million yuan;
- **Automotive-grade certification:** dual certification of national standards and car manufacturers, with a cycle of 12-18 months and a cost of 50 million to 100 million yuan.

For small and medium-sized manufacturers with annual revenue generally less than 1 billion yuan and net profit margin of 3%-5%, this investment is almost equivalent to the total net profit of 3-5 years. With the tightening financing environment, the risk of a broken capital chain is extremely high.

3. Market squeeze: Leading companies lock in the high-end market, leaving no room for small and medium-sized enterprises.After the national standard is implemented, the market will quickly divide into two camps:

- **Leading companies** (CATL, BYD, Guoxuan High-Tech, etc.): With full-industry chain collaboration, mature technology, and stable production capacity, they have secured core scenarios such as high-end passenger vehicles, energy storage, and aviation, achieving a gross profit margin of 38%, far exceeding the industry average of 22%.
- **Small and medium-sized manufacturers:** If they barely meet the standards, they can only retreat to the marginal markets such as low-speed vehicles, two-wheeled vehicles, and low-end energy storage, where price wars are fierce and gross profit margins are less than 15%; if they do not meet the standards, they will be directly eliminated from the market.

Even more serious is the fact that downstream automakers have made it clear that **new models after July cannot be equipped with "pseudo-solid-state batteries" that have not passed national standard certification** . This means that small and medium-sized manufacturers have lost their largest downstream export market, resulting in a precipitous drop in orders.

Part 03

What makes leading companies so confident and stable? Four core advantages.
Amidst industry consolidation, leading companies such as CATL, BYD, Guoxuan High-Tech, and Ganfeng Lithium not only defy national standards but also view them as opportunities **to expand market share and solidify their competitive advantages** . Their core strengths are

difficult for smaller manufacturers to replicate in the short term.

1. Comprehensive technology layout ensures controllable risks and faster implementation.Taking CATL as an example, it simultaneously deploys three major solid-state routes **—sulfides, oxides, and polymers** —plus a condensed-state transition scheme:

- **Condensed matter galvanic cells** : energy density 500Wh/kg, already in mass production and supply, large-scale production to begin by the end of 2026;
- **All-solid-state sulfide production** : The 5GWh pilot line has been put into operation, and small-batch mass production is planned for 2027;
- **Oxide route:** Sufficient technical reserves, suitable for high-safety scenarios.

This comprehensive approach allows for rapid response to national standards while mitigating the risks of technological iteration, preventing a complete loss from "betting on the wrong path." In contrast, small and medium-sized manufacturers typically focus on only a single approach, resulting in extremely low tolerance for technological errors.

2. Full supply chain control, resulting in lower costs and higher yield rates.The core cost of solid-state batteries comes from five major components: **electrolyte, cathode, anode, separator, and equipment** . Leading companies achieve optimal cost across the entire industry chain through vertical integration.

- **Upstream materials:** CATL, Ganfeng Lithium, and other companies have secured resources such as lithium, cobalt, and nickel, and have independently developed electrolyte materials with a purity of 99.99%, reducing costs by 40%.
- **Midstream manufacturing:** Lead Intelligent Equipment, Han's Laser, and other companies have developed their own specialized equipment adapted to solid-state processes, increasing yield to over 95%, while small and medium-sized manufacturers only achieve 70%–80% yield with outsourced equipment;
- **Downstream applications:** Deeply integrated with automakers such as BYD, NIO, and XPeng, with orders locked in for 3-5 years and capacity utilization exceeding 90%.

3. Strong financial resources, able to withstand investment and the time commitment.The process of solid-state batteries going from technological maturity to mass production and profitability takes at least 5-8 years and requires continuous and substantial investment. Leading companies have ample cash flow.

- **CATL:** Net profit to exceed 45 billion yuan in 2025, with R&D investment exceeding 12 billion yuan;
- **BYD:** Net profit to exceed 28 billion yuan in 2025, with solid-state business raising over 5 billion yuan independently;
- **Guoxuan High-Tech:** Received strategic investments from Volkswagen and CATL, with capital reserves exceeding 8 billion yuan.

Small and medium-sized manufacturers **have limited financing channels and small capital scale** , making them extremely vulnerable to risks in the face of long-term high investment.

4. Strong patent barriers form a "moat"Solid-state battery core patents are concentrated in three major areas: **electrolyte materials, interface modification, and fabrication processes** . As of May 2026:

- **Chinese companies:** Solid-state battery patents account for 62%, with CATL, BYD, and Guoxuan High-Tech ranking in the top three;
- **Japanese and South Korean companies, including** Toyota, Honda, and Samsung SDI, have over 1,300 core patents related to sulfide-based technologies.

Leading companies create strong barriers to entry through **cross-licensing of patents and the construction of patent pools** . Small and medium-sized manufacturers are highly susceptible to patent infringement disputes and face the risk of huge compensation or production stoppage if they want to meet the standards.

Part 04

The final stage of industry reshuffling: Soaring concentration, the era of oligopolies is coming?

1. Short term (second half of 2026 – 2027): 30% of SMEs will be eliminated, and market concentration will rise to 80%.After the national standard is implemented, hybrid solid-liquid batteries will gradually withdraw from the high-end market, and pseudo-solid-state battery companies will be eliminated more quickly. Industry forecasts:

- By the end of 2026: Approximately 30% of small and medium-sized manufacturers will cease production or be acquired.
- By the end of 2027: The CR5 (concentration of the top five companies) of the solid-state battery market will exceed 80%, forming a five-way oligopoly pattern of CATL, BYD, Guoxuan High-tech, Ganfeng Lithium, and Farasis Energy.

2. Mid-term (2028–2030): All-solid-state technology scaled up, giants dominate the high-end market.As the technology matures and costs decrease, **all-solid-state batteries** are gradually achieving mass production.

- 2028: The cost of all-solid-state batteries will drop to 0.8 yuan/Wh, approaching the level of liquid batteries;
- By 2030: China's solid-state battery market size will exceed 500 billion yuan, accounting for over 70% of the global market.
- High-end market: 90% of the market share is occupied by leading companies, and small and medium-sized manufacturers can only survive in marginal markets such as low-speed vehicles and energy storage.

3. Long-term: Are there really no other way out for small and medium-sized manufacturers? Three paths to break the deadlock.Despite the grim situation, small and medium-sized manufacturers are not necessarily doomed; they can find a way to survive through differentiation strategies.

- **Focusing on niche scenarios:** Abandoning the passenger vehicle market, we are deeply cultivating markets with lower energy density requirements and cost sensitivity, such as two-wheeled vehicles, low-speed vehicles, construction machinery, and low-end energy storage.
- **Partnering with regional automakers:** Deeply collaborating with local small automakers and special-purpose vehicle companies to provide customized hybrid solid-liquid batteries that meet basic national standards;
- **Technological differentiation breakthroughs:** Focus on routes where leading companies have a weaker presence, such as oxide solid-state and polymer solid-state, or develop technological advantages in niche segments such as solid-state battery recycling and solid electrolyte auxiliary materials.

Part 05

National standards are not the end, but a new starting point for the rationalization of industry. The national standard for solid-state batteries, which came into effect on July 1, was never intended to "eliminate small and medium-sized manufacturers," but rather to **end hype, purify the industry ecosystem, and promote the implementation of the technology** .In recent years, the solid-state battery industry has been rife with problems and bubbles: PPT-based battery manufacturers, concept-driven financing, and false advertising have proliferated, misleading consumers and hindering companies genuinely focused on technology and R&D. The implementation of national standards **will allow competition to return to technology and value to products** , which is a significant boon for the long-term healthy development of the industry.For small and medium-sized manufacturers, **crisis hides opportunity** : they can either face the gap squarely, make a decisive transformation, and cultivate their expertise in niche markets; or they can band together, merge and reorganize to improve their scale and technological strength; or they can accept reality and exit in an orderly manner to avoid greater losses.For leading companies, **the national standard is a new starting point** : leveraging their advantages in technology, production capacity, capital, and patents, they can accelerate the large-scale deployment of solid-state batteries and propel China from a follower in solid-state battery technology to a global leader.With the 0.5% weightlessness threshold already set, the countdown to an industry reshuffle has begun. The solid-state battery sector has never been a "one-man show by giants," but it is certainly an arena for competition based on technology and

strength.