

Lithium Battery Knowledge

**Why Are Prismatic Batteries
Wrapped with Blue Film?**



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ADER-DES Consulting Team

The external blue film (blue coating) on prismatic lithium-ion batteries serves multiple functional and technical purposes.

Below is a detailed explanation:

1. Insulation Protection and Short-Circuit Prevention

- The casing of prismatic batteries is typically made of metal (e.g., aluminum alloy). Direct contact between metal surfaces may cause short circuits between adjacent batteries or with external components. The blue film acts as an insulating layer to isolate the metal surface and prevent accidental conductivity.
- Enhanced Safety: In densely packed battery modules, the blue film reduces short-circuit risks caused by casing contact, improving overall safety.

2. Corrosion Resistance and Environmental Sealing

- The blue film shields the metal casing from moisture, salt spray, acids, alkalis, and other corrosive elements, delaying oxidation and rust to extend battery lifespan.
- Sealing Support: Some blue films exhibit waterproof and dustproof properties, complementing the battery encapsulation process to enhance sealing integrity.

3. Mechanical Protection Against Physical Damage

- During transportation, assembly, or use, the blue film mitigates scratches, impacts, or abrasions to the battery casing, preventing structural exposure or electrolyte leakage due to casing damage.
- Cushioning Effect: Certain blue films are elastic, absorbing minor shocks to maintain the structural stability of internal electrodes and separators.

4. Thermal Management and Heat Dissipation Optimization

- Some blue films incorporate thermally conductive particles (e.g., ceramics, graphite) to evenly distribute surface temperatures and prevent localized overheating. The dark blue color may also facilitate heat radiation.
- Thermal Insulation: In extreme high-temperature environments, the blue film can act as a heat barrier, reducing external thermal influence on the battery.

5. Identification and Model Differentiation

- Blue is commonly used to indicate specific battery models, capacities, or voltage levels, simplifying sorting during production and quick identification during maintenance.

- Brand Recognition: Manufacturers adopt uniform colors (e.g., CATL's iconic blue film) to reinforce brand identity and deter counterfeiting.

- Traceability: Some blue films are printed with QR codes or batch numbers, enabling rapid production data tracing through color coding.

6. Process and Cost Efficiency for Automation

- Blue films offer high contrast in machine vision systems, aiding in automated positioning, inspection of coating integrity, and improving production efficiency.
- Material Cost: Blue polyethylene terephthalate (PET) and other insulating films are cost-effective, balancing performance and economic viability.

7. Special Functional Requirements

- Flame Retardancy: Certain blue films contain flame retardants to slow fire spread under high temperatures, complying with battery safety standards.
- UV Resistance: Blue pigments may provide superior UV resistance, delaying film degradation in outdoor energy storage applications.



Web: www.ader-des.com

Contacts: Luna

E-mail: luna@ader-des.com