Battery Management and Thermal Safety

Electric Vehicle & Charging Station Industry

CRITICAL - BATTERY ASSEMBLY & INTEGRATION

Cells are matched for voltage and internal resistance before assembly.

Compliant | Partially Compliant | Non-Compliant | NA

Busbars, cables, and connectors are free from corrosion and secured properly.

Compliant | Partially Compliant | Non-Compliant | NA

Thermal interface materials (TIM) are applied evenly to ensure uniform heat distribution.

Compliant | Partially Compliant | Non-Compliant | NA

High-voltage connections have insulation sleeves and terminal covers installed.

Compliant | Partially Compliant | Non-Compliant | NA

Battery enclosures meet IP67/IP69 protection rating.

Compliant | Partially Compliant | Non-Compliant | NA

Cell voltage, temperature, and SOC (State of Charge) are recorded after assembly.

Compliant | Partially Compliant | Non-Compliant | NA

All battery fasteners are torqued as per assembly specification.

Compliant | Partially Compliant | Non-Compliant | NA

No physical damage (dent, swelling, puncture) is observed in any cell before welding.

Compliant | Partially Compliant | Non-Compliant | NA

Cell tabs and weld joints are visually and electrically tested.

Compliant | Partially Compliant | Non-Compliant | NA

CRITICAL - BMS (BATTERY MANAGEMENT SYSTEM) FUNCTIONALITY

BMS firmware version and calibration ID are verified.

Compliant | Partially Compliant | Non-Compliant | NA

BMS performs cell balancing correctly within defined voltage limits.

Compliant | Partially Compliant | Non-Compliant | NA

Communication between BMS and vehicle control unit (VCU) is stable.

Compliant | Partially Compliant | Non-Compliant | NA

BMS diagnostic and fault logging features are active.

Compliant | Partially Compliant | Non-Compliant | NA

BMS current measurement and SOC estimation accuracy are verified.

Compliant | Partially Compliant | Non-Compliant | NA

DOCUMENTATION & RECORDS - TESTING & TRACEABILITY

All charge/discharge test logs are maintained digitally.

Compliant | Partially Compliant | Non-Compliant | NA

Each battery pack has a unique QR/barcode for traceability.

Compliant | Partially Compliant | Non-Compliant | NA

Battery safety data sheets (MSDS) are available and accessible.

Compliant | Partially Compliant | Non-Compliant | NA

Battery test benches are equipped with calibrated measurement instruments.

Compliant | Partially Compliant | Non-Compliant | NA

FIRE CONTROL & EMERGENCY PREPAREDNESS

Fire suppression system (inergen, aerosol, or dry powder) is installed in battery zones.

Compliant | Partially Compliant | Non-Compliant | NA

Temperature alarms are integrated with plant fire alarm system.

Compliant | Partially Compliant | Non-Compliant | NA

Battery fire blankets or sand buckets are available in assembly and test areas.

Compliant | Partially Compliant | Non-Compliant | NA

Emergency evacuation routes are defined for battery assembly zones.

Compliant | Partially Compliant | Non-Compliant | NA

Fire drills specific to battery incidents conducted every 6 months.

Compliant | Partially Compliant | Non-Compliant | NA

MAINTENANCE - THERMAL MANAGEMENT SYSTEM

Cooling fans or liquid cooling systems are functional and leak-free.

Compliant | Partially Compliant | Non-Compliant | NA

Thermal runaway sensors are installed and tested for responsiveness.

Compliant | Partially Compliant | Non-Compliant | NA

Thermal interface materials are replaced as per maintenance schedule.

Compliant | Partially Compliant | Non-Compliant | NA

Temperature gradient across battery pack remains within design tolerance.

Compliant | Partially Compliant | Non-Compliant | NA

Over-temperature cut-off systems are tested quarterly.

Compliant | Partially Compliant | Non-Compliant | NA

Temperature sensors (NTC/PTC) are calibrated and verified periodically.

Compliant | Partially Compliant | Non-Compliant | NA

STORAGE & LOGISTICS – CRITICAL

Battery packs are transported in shockproof, flame-resistant containers.

Compliant | Partially Compliant | Non-Compliant | NA

State of Charge (SOC) before shipment maintained between 30–50%.

Compliant | Partially Compliant | Non-Compliant | NA

Storage area for batteries is segregated from flammable materials.

Compliant | Partially Compliant | Non-Compliant | NA

SUPER CRITICAL - BATTERY HANDLING & STORAGE

All lithium-ion cells are sourced from certified suppliers with valid UN38.3 and IEC 62133 compliance.

Compliant | Partially Compliant | Non-Compliant | NA

Battery packs are handled in ESD-protected areas with grounded flooring and wrist straps.

Compliant | Partially Compliant | Non-Compliant | NA

Cells and modules are stored at recommended temperature (15°C–25°C) and humidity (<50% RH).

Compliant | Partially Compliant | Non-Compliant | NA

No metal objects or conductive materials are placed near exposed terminals.

Compliant | Partially Compliant | Non-Compliant | NA

Defective or damaged cells are isolated immediately in a designated quarantine area.

Compliant | Partially Compliant | Non-Compliant | NA

TRAINING & COMPETENCY - WORKFORCE

All employees handling batteries are trained in high-voltage and chemical safety.

Compliant | Partially Compliant | Non-Compliant | NA

Operators are trained in proper PPE usage (insulated gloves, face shields, antistatic apron).

Compliant | Partially Compliant | Non-Compliant | NA

Fire and emergency response team is trained for lithium battery incidents.

Compliant | Partially Compliant | Non-Compliant | NA