PROPOSED AUSTRALIAN STANDARD (AS/NZS ABTS FRAMEWORK)

This section establishes the technical engineering parameters and testing methodologies that constitute the proposed joint Australian/New Zealand Standard: **AS/NZS National Battery Transparency Standard (AS/NZS ABTS:2026)**.

1. Scope and Application

This Standard applies to all stationary Battery Energy Storage Systems (BESS) with a total nominal electrical capacity greater than or equal to 1 kWh and less than or equal to 1GWh, intended for installation in residential, commercial, or industrial environments, whether grid-tied, off-grid, or configured as part of a standalone power system (SPS).

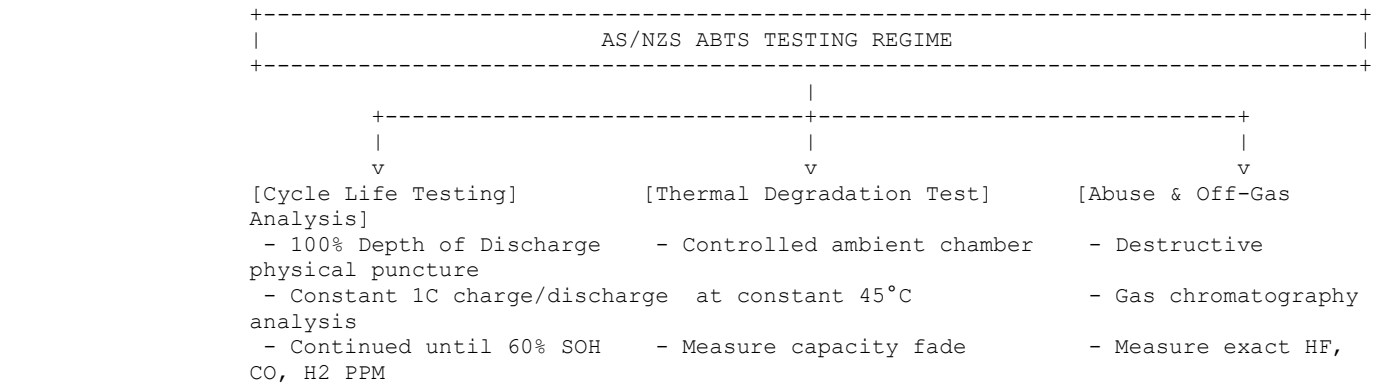
2. Normative References

This Standard incorporates, by dated or undated reference, provisions from the following publications:

- **AS/NZS 5139:** Electrical installations—Battery energy storage systems.
- **AS IEC 62619:** Secondary cells and batteries containing alkaline or other non-acid electrolytes—Safety requirements for secondary lithium cells and batteries, for use in industrial applications.
- **AS IEC 63056:** Secondary cells and batteries containing alkaline or other non-acid electrolytes—Safety requirements for secondary lithium cells and batteries for use in electrical energy storage systems.
- **IEC 62933 (all parts):** Electrical Energy Storage Systems (EESS).

3. Defined Testing Methodologies for Verifiable Parameters

To eliminate manufacturer self-certification bias, compliance with AS/NZS ABTS requires testing by a National Association of Testing Authorities (NATA) accredited laboratory, or an international equivalent recognized under the ILAC Mutual Recognition Arrangement (MRA), adhering to the following strict operational testing regimes:



A. Cycle Life and Depth of Discharge (DoD) Verification

- **Test Condition:** The BESS shall be subjected to continuous, uninterrupted charge and discharge cycles at a constant ambient temperature of $25°C \pm 2°C$.
- **Rate:** Charging and discharging shall be performed at the manufacturer's maximum continuous rated C-rate, or 0.1C, whichever is higher.

- **Execution:** Cell cycling must proceed at 100%Depth of Discharge (DoD) relative to nominal capacity, regardless of the manufacturer's software-limited operational limits, until the State of Health (SOH) degrades to 60%of initial nominal capacity.
- **Reporting:** The laboratory must plot the resulting capacity fade curve and document the exact cycle counts achieved at 90%, 80%, 70%, and 60%SOH.

B. Thermal Degradation and Climatic Resilience Factor

- **Test Condition:** The entire integrated BESS unit (including cells, battery management system (BMS), and thermal management enclosures) shall be placed within a environmental test chamber maintained at a constant 45°Cambient temperature.
- **Execution:** The system shall undergo 1,000 continuous charge/discharge cycles at 0.1Cor the maximum continuous operational rate.
- **Metric:** The resulting capacity fade must be compiled to calculate the **Australian Climatic Resilience Coefficient (C_{acr})**, expressed as:

$$C_{\text{acr}} = \frac{\text{Capacity Fade Rate at } 45°\text{C}}{\text{Capacity Fade Rate at } 25°\text{C}}$$

Any value greater than 1.3denotes high thermal vulnerability and must be clearly disclosed.

C. Abuse and Destructive Off-Gas Characterisation

- **Test Condition:** Cells pulled from the compliant BESS production line must be subjected to destructive physical abuse testing in accordance with AS IEC 62619, augmented by gas chromatography-mass spectrometry (GC-MS) analysis.
- **Testing:** Cells must be driven into thermal runaway via localized external heating ($> 300°\text{C}$) or internal mechanical puncture under full 100%State of Charge (SOC).
- **Metrics:** The test facility must capture and quantify the exact volumetric yield of emitted gas per kilogram of active cell material, defining the parts-per-million (PPM) concentrations of:
    - Hydrogen Fluoride (HF)
    - Carbon Monoxide (CO)
    - Hydrogen (H_2)
    - Hydrogen Cyanide (HCN)
- **Thermal Runaway Propensity:** The system must be categorized into one of three **Thermal Runaway Propensity (TRP)** classifications based on the maximum recorded self-heating rate:
    - *TRP-Class 1 (Intrinsically Stable):* No self-heating observed; maximum temperature remains below 80°Cunder destructive testing (e.g., advanced LTO).
    - *TRP-Class 2 (Thermally Contained):* Thermal runaway occurs at cell level but does not propagate to adjacent cells within the enclosure; off-gassing contained by onboard filtration.
    - *TRP-Class 3 (Uncontrolled Propagation Risk):* Thermal runaway propagates contiguously across adjacent cells, resulting in open flaming, cell expulsion, or casing breach.