

Proposal how to structure the RESS safety requirements

1. Scope

This document sets out minimum requirements for Rechargeable Energy Storage Systems (RESS) having a nominal energy storage capacity of more than [1 kWh] and working voltage exceeding [60 V] but less than [1,500 V].

2. Definitions

“Rechargeable energy storage system (RESS)”

means rechargeable energy storage systems which provide electric energy for electrical propulsion.

“Working voltage”

means the highest value of an electrical circuit voltage root mean square (rms), specified by the manufacturer or determined by measurement, which may occur between any conductive parts in open circuit conditions or under normal operating condition. If the electrical circuit is divided by galvanic isolation, the working voltage is defined for each divided circuit, respectively.

3. Technical Requirements

A) Priority Requirements

3.1 Vibration

3.1.1 Rationale

Simulates a vibration environment which a battery system will likely experience during its life.

3.1.2 Requirement

3.1.2.1 Conditions

[ISO 12405 Part 1]

3.1.2.2 Acceptance criteria

During the test, including the defined recovery period, the battery system shall exhibit no evidence of venting or battery enclosure rupture (no degradation of protection degree), fire, or explosion, and shall maintain high voltage to ground isolation no less than specified for the RESS type under inspection.

3.1.3 Verification

Test according to [ISO 12405 part 1] /Documentation / Calculation / Simulation

3.2 Thermal Shock

3.2.1 Rationale

3.2.2 Requirement

3.2.2.1 Conditions

3.2.2.2 Acceptance criteria

3.2.3 Verification

Proposal how to structure the RESS safety requirements

3.3 Humidity / Moisture Exposure

- 3.3.1 Rationale
- 3.3.2 Requirement
 - 3.3.2.1 Conditions
 - 3.3.2.2 Acceptance criteria
- 3.3.3 Verification

3.4 Mechanical Shock

((Enclosure Integrity may has to be considered) related to R94, R95, R12)

- 3.4.1 Rationale
- 3.4.2 Requirement
 - 3.4.2.1 Conditions
 - 3.4.2.2 Acceptance criteria
- 3.4.3 Verification

3.5 Fire Resistance

- 3.5.1 Rationale
- 3.5.2 Requirement
 - 3.5.2.1 Conditions
 - 3.5.2.2 Acceptance criteria
- 3.5.3 Verification

3.6 External Short Circuit

(related to R100)

- 3.6.1 Rationale
- 3.6.2 Requirement
 - 3.6.2.1 Conditions
 - 3.6.2.2 Acceptance criteria
- 3.6.3 Verification

3.7 Overcharge Protection (RESS or via vehicle system)

- 3.7.1 Rationale
- 3.7.2 Requirement
 - 3.7.2.1 Conditions
 - 3.7.2.2 Acceptance criteria
- 3.7.3 Verification

3.8 Over-discharge Protection

- 3.8.1 Rationale
- 3.8.2 Requirement
 - 3.8.2.1 Conditions
 - 3.8.2.2 Acceptance criteria
- 3.8.3 Verification

Proposal how to structure the RESS safety requirements

3.9 Over-temperature Protection

(related to R100)

- 3.9.1 Rationale**
- 3.9.2 Requirement**
 - 3.9.2.1 Conditions**
 - 3.9.2.2 Acceptance criteria**
- 3.9.3 Verification**

3.10 Protection against direct contact

(related to R100)

- 3.10.1 Rationale**
- 3.10.2 Requirement**
 - 3.10.2.1 Conditions**
 - 3.10.2.2 Acceptance criteria**
- 3.10.3 Verification**

3.11 Emission

(May also be part of abnormal situations like Fire Resistance etc.) and/or ECE R100 (normal use)

- 3.11.1 Rationale**
- 3.11.2 Requirement**
 - 3.11.2.1 Conditions**
 - 3.11.2.2 Acceptance criteria**
- 3.11.3 Verification**

B) Additional Requirements?

- **Immersion Test (RESS complete under water)**
- **Dust**
- **Marking**