# Test Report

# For

# ANSI/CAN/UL9540A

# Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems

# [Unit Level]

| | |
|---|---|
| **Report Number:** | **CQES221100025101** |
| **Date of issue:** | **2022-11-23** |
| **Total number of pages:** | **40** |
| **Test object / Model:** | **Lithium Ion Battery** |
| **Applicant's name:** | **StackRack Battery Systems, LLC** |
| **Address:** | **1751 California Ave #101, Corona, California 92881, The United States of America** |

## [Summary of Test results]

Cell Level Test
Cell model:
CB27173204EA
Project No:
CN21GRDU 001

| | |
|---|---|
| Cell Design: | CB27173204EA |
| Thermal Runaway Methodology: | External heating |
| Cell Surface Temperature at Gas venting: | 209.4°C |
| Cell Surface Temperature at the onset Thermal Runaway: | 270.7°C |
| Gas Composition: | Hydrocarbon, $H_2$, $CO_2$, CO |
| Lower Flammability Limit: | 5.6 Vol% at ambient temperature<br>4.5 Vol% at 200°C |
| Burning Velocity: | 83.6 cm/s |
| Pmax: | 1.015 MPa |
| Thermal Runaway was Induced in the Cell or not: | Induced |
| Cell Vent Gas is Flammable or not in Air: | Flammable |

Unit Level Test
Model: SR5K-UL
Report No:
CQES221100025101

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|---|---|
| Unit Design: | |
| Thermal Runaway Methodology: | External heating |
| External Flaming: | No external flaming observed |
| Locations of Flame Extension: | No flame extension observed |
| Flying Debris: | No flying debris observed |
| Explosion or not: | No explosion observed |
| Max. Surface Temperature of Module in Target BESS Unit: | 158.1°C |
| Max. Temperature Rise on Wall Surfaces: | 94.3°C |
| Thermal Runaway are Contained by the Unit Design or not: | Contained by the unit design |
| Cell Vent Gas is Flammable or not: | Flammable |
| Cheesecloth Indicator Flaming or not: | No flaming or carbonizing of the cheesecloth indicator |
| Test Video File: | Archived by applicant |

Remark:
1. This report only evaluated unit level test which is listed inside the dotted box.
2. All test data were copied from SGS report No. CQES220800015301, dated 2022-09-07, with change of applicant.