



Test Report

For

ANSI/CAN/UL9540A

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

[Unit Level]

Report Number: SZES211100741301

Date of issue: 2022-03-09

Total number of pages: 48

Test object / Model: NV14, NV24

Applicant's name: NeoVolta Inc.

Address: 13651 Danielson Street, Suite A, Poway CA 92064

Report Number: SZES211100741301
Manufacturer: NeoVolta Inc.
Address: 13651 Danielson Street, Suite A, Poway CA 92064
Factory: NeoVolta Inc.
Address: 13651 Danielson Street, Suite A, Poway CA 92064
Test object / Model: NV14, NV24
Test specifications: ANSI/CAN/UL9540A:2019 Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems Fourth Edition, Dated November 12, 2019
Date of receipt: 2021-11-15
Sample No.: Customer ID
Test Period: 2022-01-15 to 2022-02-15
Issuing Laboratory: SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address: No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China 518057
Testing location: SGS-CEC New Energy Technology (Chongqing) Co., Ltd. Affiliate No. 6, No. 2 Fuyun Road, Shuangfu Street, Jiangjin District, Chongqing, China (No.1 Laboratory Building, Chongqing Energy College)

Test Result: Refer to summary of test results page for details.

Remark: Test results reported relate only to the items being tested.

Strictly Confidential
 Private and Confidential
 Public

Tested by / Witness by

Reviewed by


 Ryan Hu
 Project Engineer


 Jerry Xiao
 Technical Manager



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

SGS-CSTC Standards Technical Services Co., Ltd.
 Shenzhen Branch, 2702A, 99088, China Laboratory

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgs.com.cn
 中国·深圳·科技园中区M-10栋一号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

[Summary of Test results]

Cell Level Test
 Cell model:
 IFP27173204-100
 Report No:
 SZES210300184401

Cell Design:	IFP27173204-100
Thermal Runaway Methodology:	External heating
Cell Surface Temperature at Gas venting:	158.9°C
Cell Surface Temperature at the onset Thermal Runaway:	215.7°C
Gas Composition:	Hydrocarbon, H ₂ , CO ₂ , CO, N ₂ O
Lower Flammability Limit:	9.61 Vol% at ambient temperature, 8.33 Vol% at 158.9°C
Burning Velocity:	131.0 cm/s
Pmax:	659 kPa
Thermal Runaway was Induced in the Cell or not:	Induced
Cell Vent Gas is Flammable or not in Air:	Flammable

Module Level Test
 Module model:
 SSIF2P15S48100C
 Report No:
 SZES210400254301

Module Design:	SSIF2P15S48100C
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
Gas Generation and Composition:	Hydrocarbon, H ₂ , CO, CO ₂
Thermal Runaway are Contained by the Module Design or not:	Contained by the Module Design
Cell Vent Gas is Flammable or not:	Flammable
Other Description:	N/A
Test Video File:	Archived by Applicant

Unit Level Test
 Unit model: NV14, NV24
 Report No:
 SZES211100741301

Unit Design:	NV14, NV24
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. Temperature Rise on Wall Surfaces:	121°C
Thermal Runaway are Contained by the Unit Design or not:	Contained by the Unit Design
Cell Vent Gas is Flammable or not:	Flammable
Heat Flux in the Center of Egress:	0.09015 kW/m ²
Cheesecloth Indicator Flaming or not:	No flaming or carbonizing of the cheesecloth indicator
Test Video File:	Archived by Applicant

Remark: This report only evaluated unit level test which is listed inside the dotted box.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

SGS CSTC Shenzhen Technical Services Co., Ltd. No.1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgs.com.cn
 Shenzhen Branch of SGS (Shenzhen) Laboratory 中国·深圳·科技园中区M-10栋一号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com