

# Test Report

For

**ANSI/CAN/UL9540A**

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

**[Unit Level]**

**Report Number: CQES240300014301**

**Date of issue: 2024-03-14**

**Total number of pages: 41**

**Test object / Model: Lithium Ion Battery R-Bracket**

**Applicant's name: Shanghai PYTES Energy Co., Ltd.**

**Address: No. 3492 Jinqian Road, Qingcun Town, Fengxian District, Shanghai, China**



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

**Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com**

SGS-CEC Energy Technology (Chongqing) Co., Ltd.

Building 13 & 14, No. 1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260

t (86-023) 863676001 www.sgs.com

中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260

t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

**Report Number:** CQES240300014301  
**Manufacturer:** Shanghai PYTES Energy Co., Ltd.  
**Address:** No. 3492 Jinqian Road, Qingcun Town, Fengxian District, Shanghai, China  
**Factory:** Shanghai PYTES Energy Co., Ltd.  
**Address:** No. 3492 Jinqian Road, Qingcun Town, Fengxian District, Shanghai, China  
**Test object / Model:** Lithium Ion Battery  
 R-Bracket  
**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:** 2022-07-18  
**Sample No.:** Customer ID  
**Test Period:** Original test date: 2022-07-18 to 2022-08-15  
**Issuing Laboratory:** SGS-CEC New Energy Technology (Chongqing) Co., Ltd.  
**Address:** Building 13 & 14, No. 1839, Ranjun Road, Shuangfu Street, Jiangjin District,  
 Chongqing, China  
 SGS-CEC New Energy Technology (Chongqing) Co., Ltd.  
**Testing location:** Building 13 & 14, No. 1839, Ranjun Road, Shuangfu Street, Jiangjin District,  
 Chongqing, China

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

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

Strictly Confidential

**Confidential level:**  Private and Confidential

Public

**Tested by / Witness by**

**Reviewed by**

  
 Kyle Tian  
 Project Engineer

  
 Ryan Hu  
 Project 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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

**Attention:** To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No. 1839, Ranjun Road, Shuangfu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

## [Summary of Test results]

Cell Level Test  
Cell model:  
  
Project No:  
CN21GRDU 001

|  |  |
|--|--|
| Cell Design:   |  |
| 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 <sub>2</sub> , CO <sub>2</sub> , 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  |

Module Level Test  
Module model: E-BOX 48100R  
Report No:  
CQES230800040401

|  |   |
|--|---|
| Module Design:   | E-BOX 48100R  |
| Thermal Runaway Methodology:                               | External heating using film heater                        |
| External Flaming:  | No external flaming observed                              |
| Locations of Flame Venting:                                | No flame extension observed                               |
| Flying Debris:   | No flying debris observed                                 |
| Peak Smoke Release Rate :                                  | 3.784 m <sup>2</sup> /s                                   |
| Gas Generation and Composition:                            | Mainly Hydrocarbon, H <sub>2</sub> , CO <sub>2</sub> , CO |
| 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  
Model: R-Bracket  
Report No:  
CQES240300014301

|  |  |
|--|--|
| Unit Design:   | R-Bracket  |
| 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. **This report is issued based on previous report CQES230800040501, dated on 2023-12-08, with the update of UL 9540 compliance (according to the certificate of SGSNA/22/SH/00250, dated on 14 March 2024, and SGSNA/22/SH/00251, dated on 20 February 2024).**



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

After comparison, no further tests were considered necessary. All test data were cited from original test report CQES220800015301.

### Report Revision History

| Report No.       | Date       | Description of Change  |
|------------------|------------|--|
| CQES220800015301 | 2022-09-07 | Initial issued.  |
| CQES230800040501 | 2023-12-08 | <ol style="list-style-type: none"> <li>1. Change the address of applicant, manufacturer and factory.</li> <li>2. Modified the Max. charge and discharge current of battery module.</li> <li>3. Added the module level test results.</li> </ol> |
| CQES240300014301 | 2024-03-14 | Updated the UL9540 compliance.   |



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CEC Energy Technology (Chongqing) Co., Ltd

Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260

t (86-023) 863676001 www.sgsgroup.com.cn

中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260

t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

**[Test object Description]**

Table 1: Description of component cell

|                           |   |   |
|---------------------------|---|---|
| Model:                    |   |   |
| Manufacturer:             |   |   |
| Nominal capacity:         | 100 Ah  |   |
| Nominal voltage:          | 3.2 V   |   |
| Chemistry:                | Lithium ion, LiFePO4  |   |
| Charge current:           | 100 A   |   |
| Discharge current:        | 100 A   |   |
| Maximum charge voltage:   | 3.65 V  |   |
| Cut-off Voltage:          | 2.5 V   |   |
| External dimensions:      | 207.01±0.6mm *174.7mm±0.6mm * 27.5mm±1.0mm                            |   |
| UL 1973 compliant:        | <input type="checkbox"/> Yes / <input type="checkbox"/> No            | N/A   |
| UL 9540A report provided: | <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No | Reference: Report No. CN21GRDU 001, issued by TÜV Rheinland |

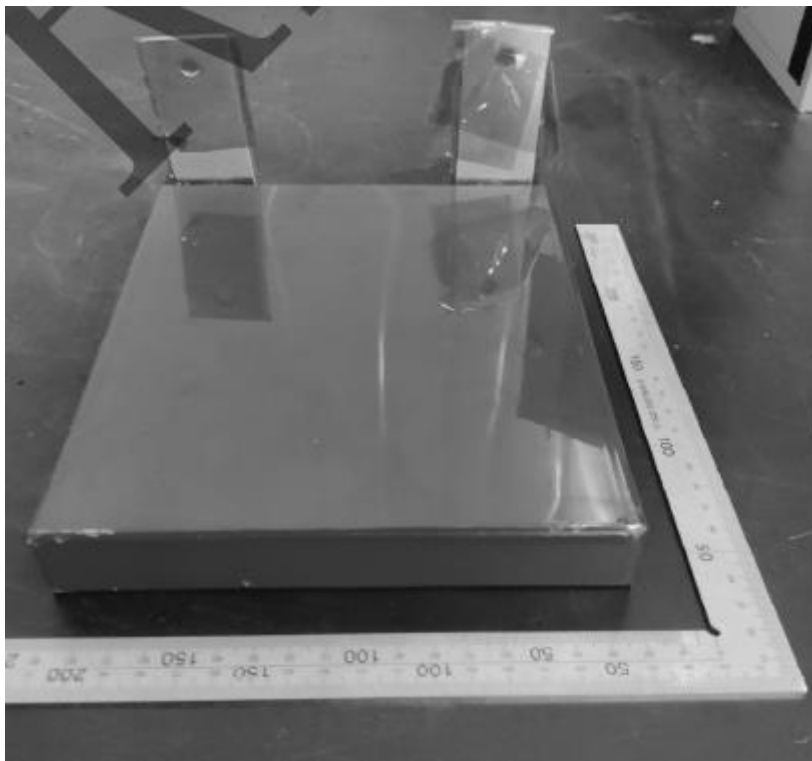


Figure 1. View of component cell



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgsgroup.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



Table 2: Description of battery module

|                              |   |  |
|------------------------------|---|--|
| Model:                       | E-BOX 48100R  |  |
| Manufacturer:                | Shanghai PYTES Energy CO., Ltd.                                       |  |
| Nominal capacity:            | 100 Ah  |  |
| Nominal voltage:             | 51.2 V  |  |
| Maximum charge current:      | 50 A  |  |
| Maximum discharge current:   | 50 A  |  |
| Maximum charge voltage:      | 58 V  |  |
| Cut-off Voltage:             | 47.5 V  |  |
| Charge temperature range:    | 0°C to 45°C   |  |
| Discharge temperature range: | -10°C to 50°C   |  |
| Unit configuration:          | 16S   |  |
| External dimensions:         | 440mm*620mm*117mm   |  |
| Enclosure material:          | Iron  |  |
| Weight:                      | Apr. 51Kg   |  |
| UL 1973 compliant:           | <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No | Reference: TÜV SÜD Certif. No.: U10 003364 0009 Rev.01 |
| UL 9540A report provided:    | <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No | Reference: Report No. CQES230800040401 issued by SGS   |



Figure 2a. External view of battery module



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

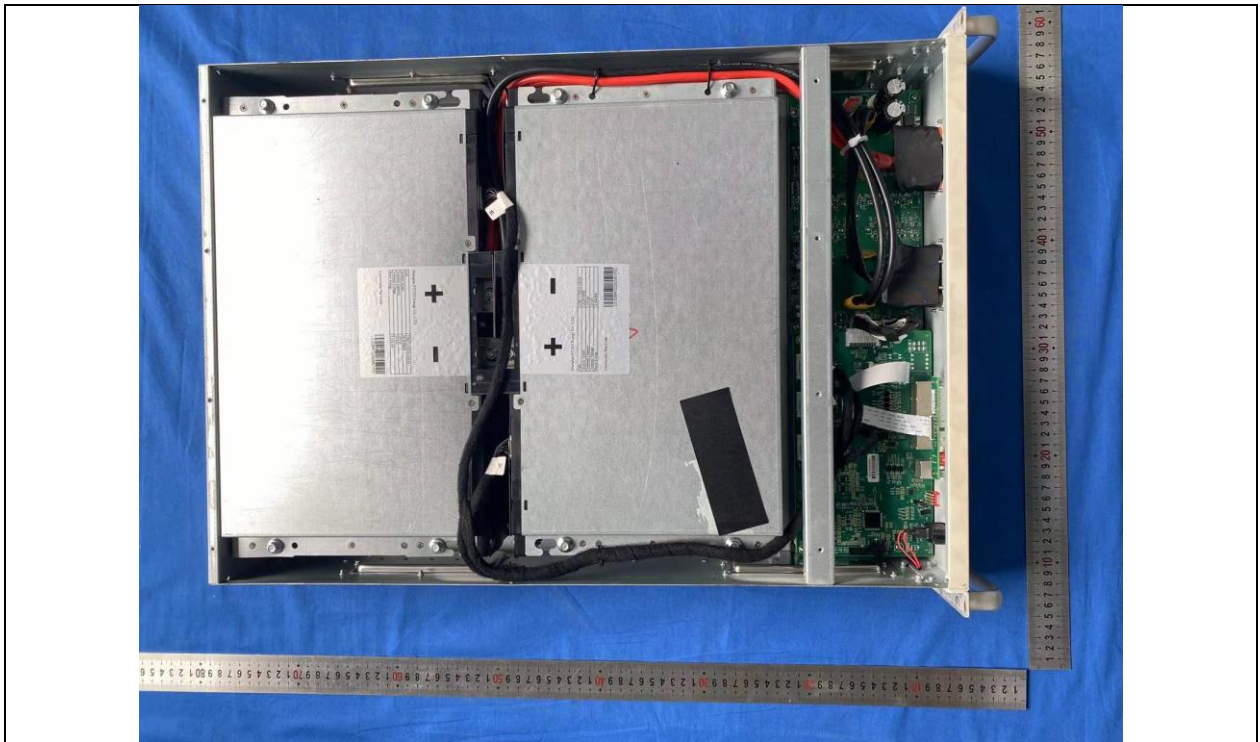


Figure 2b. Internal view of battery module

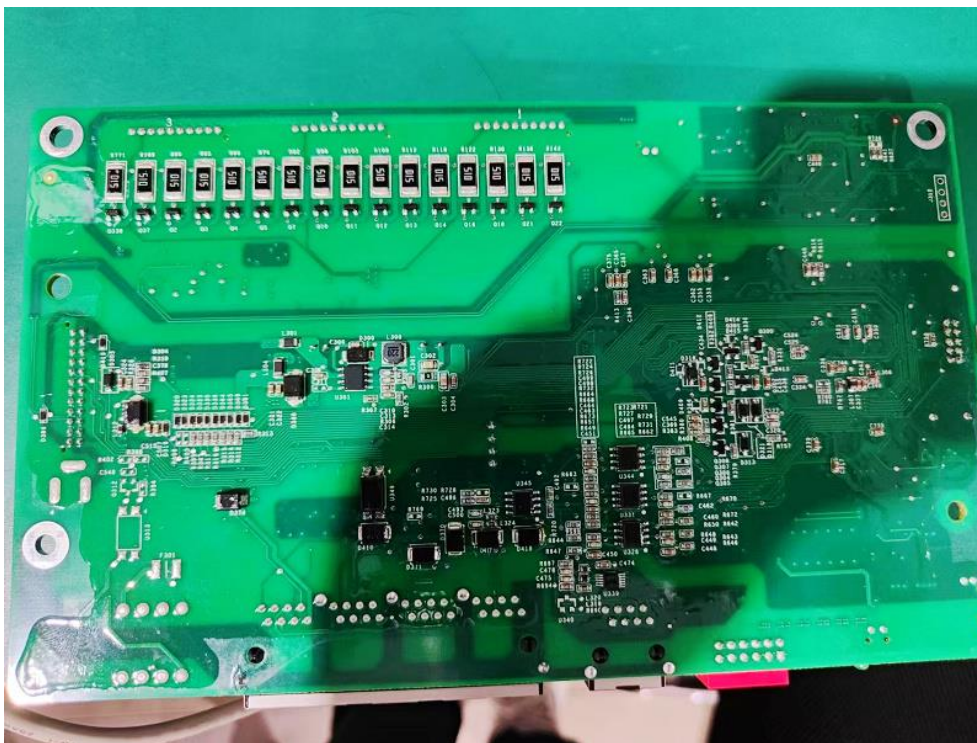


Figure 2c. View 01 of BMS



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



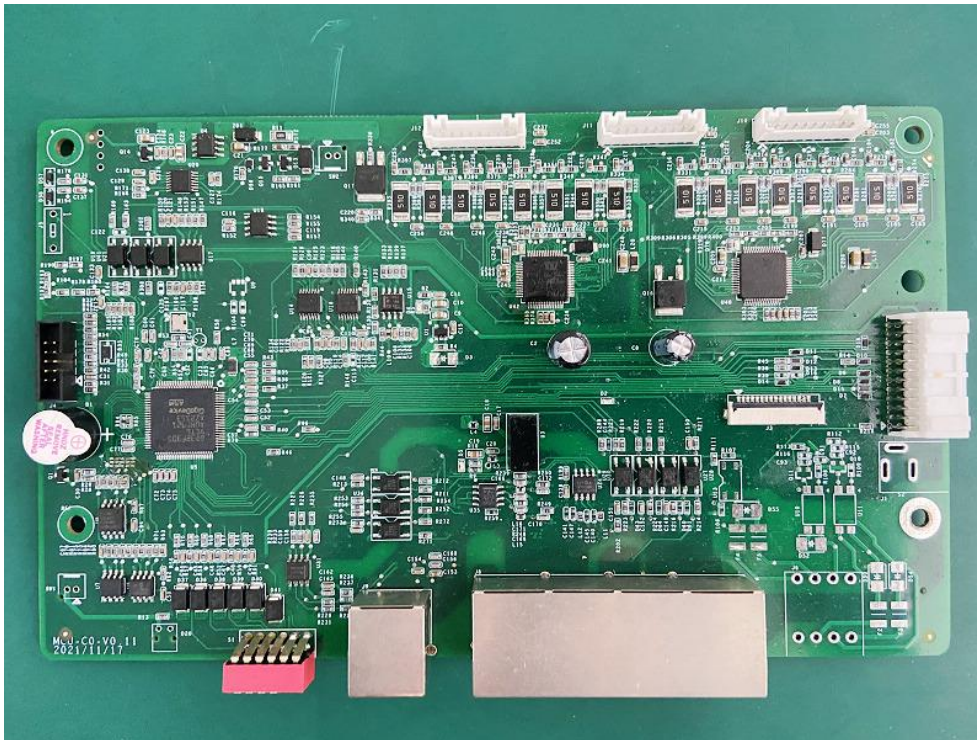


Figure 2d. View 02 of BMS

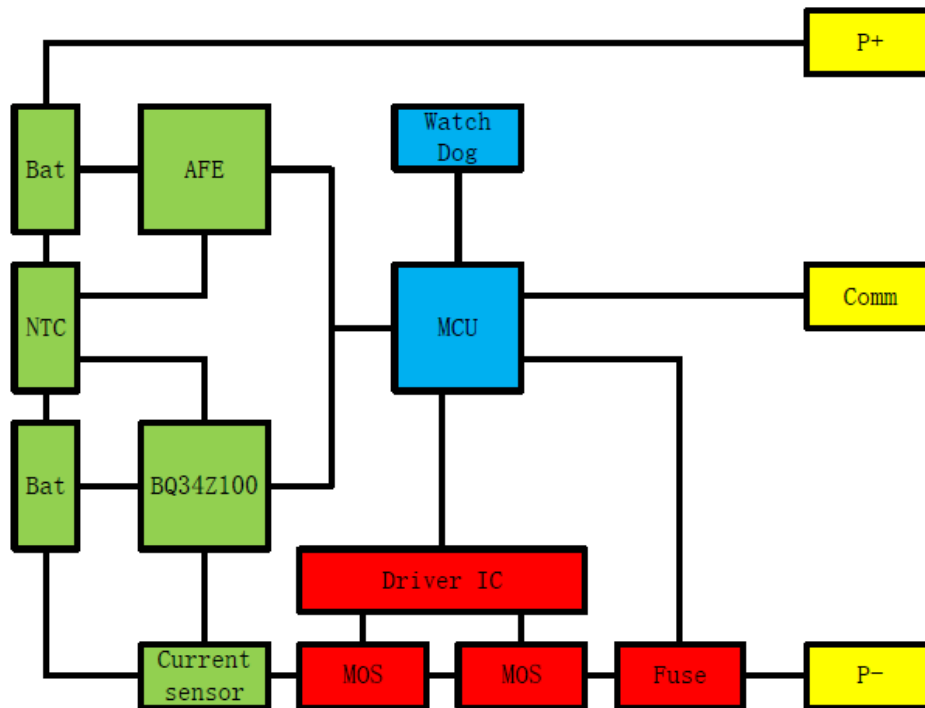


Figure 2e. Electrical configuration of battery system



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuangfu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



Table 3: Description of battery unit

|                                 |   |   |
|---------------------------------|---|---|
| Model:                          | R-Bracket   |   |
| Manufacturer:                   | Shanghai PYTES Energy CO., Ltd.                                       |   |
| Nominal capacity:               | 100 Ah x 8  |   |
| Nominal voltage:                | 51.2 V  |   |
| Module designation:             | Lithium ion, LiFePO <sub>4</sub>                                      |   |
| Maximum charge voltage:         | 58 V  |   |
| Cut-off Voltage:                | 47.5 V  |   |
| Charge temperature range:       | 0°C to 45°C   |   |
| Discharge temperature range:    | -10°C to 50°C   |   |
| Unit configuration:             | 8P  |   |
| External dimensions:            | 525mm*725mm*1080mm  |   |
| Enclosure material:             | Iron  |   |
| Fire suppression system contain | <input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No | Reference: N/A  |
| UL 1973 compliant:              | <input type="checkbox"/> Yes / <input type="checkbox"/> No            | Reference: N/A  |
| <b>UL 9540 compliant:</b>       | <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No | <b>Reference:</b><br><b>SGS Cert. No. : SGSNA/22/SH/00250</b><br><b>SGS Cert. No. : SGSNA/22/SH/00251</b> |



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CEC Energy Technology (Chongqing) Co., Ltd.

Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260

t (86-023) 863676001 www.sgsgroup.com.cn

中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260

t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



Figure 3a. View 01 of battery unit



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CEC Energy Technology (Chongqing) Co., Ltd.

Building 13 & 14, No. 1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260

t (86-023) 863676001

[www.sgsgroup.com.cn](http://www.sgsgroup.com.cn)

中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260

t (86-023) 863676001

[sgs.china@sgs.com](mailto:sgs.china@sgs.com)

Member of the SGS Group (SGS SA)



Figure 3b. View 02 of battery unit



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CEC Energy Technology (Chongqing) Co., Ltd.

Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260

t (86-023) 863676001 www.sgs.com.cn

中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260

t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



## [Description of thermal runaway methodology]

### Sample and test configuration

The unit level test shall be conducted with BESS (Battery Energy Storage System) units installed as described in the manufacturer's instructions and this section.

The unit level test requires one initiating BESS unit in which an internal fire condition in accordance with the module level test is initiated and target adjacent BESS units representative of an installation. Tests conducted for indoor floor mounted installations shall be considered representative of both indoor floor mounted and outdoor ground mounted installations with fire propagation hazards and separation distances between initiating and target units representative of the installation. Tests shall be conducted indoors with fire propagation hazards and separation distances between initiating and target units representative of the installation. The results of such tests shall be considered to also represent an outdoor installation.

Depending upon the configuration and design of the BESS (e.g. the BESS is composed of multiple separate parts within separate enclosures), this testing to determine fire characterization can be done at the battery system level. The suitability of this approach shall be determined based upon the overall design of the BESS and an analysis of the battery system as representative of the overall BESS for fire characterization concerns.

The initiating BESS unit shall contain components representative of a BESS unit in a complete installation. Combustible components that interconnect the initiating and target BESS units shall be included.

Target BESS units shall include the outer cabinet (if part of the design), racking, module enclosures, and components that retain cells components. The target BESS unit module enclosures do not need to contain cells.

The initiating BESS unit shall be at the maximum operating state of charge (MOSOC), in accordance with the manufacturer's specifications, for conducting the tests in this standard. After charging and prior to testing, the initiating BESS shall rest for a maximum period of 8 h at room ambient.

If a BESS unit includes an integral fire suppression system, there is an option of providing this with the DUT. If the BESS unit is provided with an optional integral fire suppression system, the system shall not be provided on the DUT.

Electronics and software controls such as the battery management system (BMS) in the BESS are not relied upon for this testing. This does not include a fire suppression control in accordance with UL 840 that is external to the BESS, but provided as part of an integral fire suppression system.

Table 4: Integral fire suppression system information

| Integral fire suppression system information | No integral fire suppression system   |
|--|---|
| Standard or optional                         | <input type="checkbox"/> Standard / <input type="checkbox"/> optional / <input checked="" type="checkbox"/> N/A |
| Test with fire suppression or not            | <input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No   |



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.  
**Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com**  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

Table 5: BESS installations/ Test configurations

|  |
|--|
| Description:   |
| <input type="checkbox"/> a) Indoor floor mounted non-residential use BESS        |
| <input checked="" type="checkbox"/> b) Indoor floor mounted residential use BESS |
| <input type="checkbox"/> c) Outdoor ground mounted non-residential use BESS      |
| <input type="checkbox"/> d) Outdoor ground mounted residential use BESS          |
| <input type="checkbox"/> e) Indoor wall mounted non-residential use BESS         |
| <input type="checkbox"/> f) Indoor wall mounted residential use BESS             |
| <input type="checkbox"/> g) Outdoor wall mounted non-residential use BESS        |
| <input type="checkbox"/> h) Outdoor wall mounted residential use BESS            |
| <input type="checkbox"/> i) Rooftop garage non-residential use BESS              |
| <input type="checkbox"/> j) Open garage non-residential use BESS                 |

Test configurations for Indoor floor mounted residential use BESS

|  |   |       |
|--|---|-------|
|  | A | 50 mm |
|  | B | 50 mm |
|  | C | 50 mm |
|  | D | 0 mm  |
|  | E | 0 mm  |
|  | F | 0 mm  |
|  | G | 50 mm |
|  | H | 0 mm  |



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.  
**Attention:** To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgsgroup.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

## Unit level Test method description

### Test method – Indoor floor mounted BESS units

Samples and test configurations are in accordance with Table 5. During the test, the test room environment shall be controlled to prevent drafts that may affect test results. At the start of the test, the room ambient temperature shall not be less than 10°C (50°F) nor more than 32°C (90°F).

Any access door(s) or panels on the initiating BESS unit and adjacent target BESS units shall be closed, latched and locked at the beginning and duration of the test.

The initiating BESS unit shall be positioned adjacent to two instrumented wall sections.

Instrumented wall sections shall extend not less than 1.6 ft (0.49 m) horizontally beyond the exterior of the target BESS units.

The surface of the instrumented wall sections shall be covered with 16-mm (5/8-in) gypsum wall board and painted flat black. The initiating BESS unit shall be centered underneath an appropriately sized smoke collection hood of an oxygen consumption calorimeter.

The light transmission in the calorimeter's exhaust duct shall be measured using a white light source and photo detector for the duration of the test, and the smoke release rate shall be calculated.

The chemical and convective heat release rates shall be measured for the duration of the test. The heat release rate measurement system shall be calibrated using an atomized heptane diffusion burner. The calibration shall be performed using flows of 3.8, 7.6, 11.4 and 15.2 L/min (1, 2, 3 and 4 gpm) of heptane.

The convective heat release rate shall be measured using thermopile, a velocity probe, and a Type K thermocouple, located in the exhaust system of the exhaust duct. the convective heat release rate shall be calculated using the following equation:

$$HRR_c = V_e A \frac{353.22}{T_e} \int_{T_o}^T C_p dT$$

The physical spacing between BESS units (both initiating and target) and adjacent walls shall be representative of the intended installation.

Separation distances shall be specified by the manufacturer for distance between:

- a) The BESS units and the instrumented wall sections; and
- b) Adjacent BESS units.

Wall surface temperature measurements shall be collected for BESS intended for installation in locations with combustible construction. If the intended installation is composed completely of noncombustible construction in which wall assemblies, cables, wiring and any other combustible materials are not to be present in the BESS installation, then the report should note that the installation shall contain no combustible construction and that surface temperature rises can be deemed not applicable.

Wall surface temperatures shall be measured in vertical array(s) at 152-mm (6-in) intervals for the full height of the instrumented wall sections using No. 24-gauge or smaller, Type-K exposed junction thermocouples. The thermocouples for measuring the temperature on wall surfaces shall be horizontally positioned in the wall locations anticipated to receive the greatest thermal exposure from the initiating BESS unit.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.  
**Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com**  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



Thermocouples shall be secured to gypsum surfaces by the use of staples placed over the insulated portion of the wires. The thermocouple tip shall be depressed into the gypsum so as to be flush with the gypsum surface at the point of measurement and held in thermal contact with the surface at that point by the use of pressure-sensitive paper tape.

Heat flux shall be measured with the sensing element of at least two water-cooled Schmidt-Boelter gauges at the surface of each instrumented wall:

- a) Both are collinear with the vertical thermocouple array;
- b) One is positioned at the elevation estimated to receive the greatest heat flux due to the thermal runaway of the initiating module; and
- c) One is positioned at the elevation estimated to receive the greatest heat flux during potential propagation of thermal runaway within the initiating BESS unit.

Heat flux shall be measured with the sensing element of at least two water-cooled Schmidt-Boelter gauges at the surface of each adjacent target BESS unit that faces the initiating BESS unit:

- a) One is positioned at the elevation estimated to receive the greatest heat flux due to the thermal runaway of the initiating module within the initiating BESS; and
- b) One is positioned at the elevation estimated to receive the greatest surface heat flux due to the thermal runaway of the initiating BESS.

For non-residential use BESS, heat flux shall be measured with the sensing element of at least one water-cooled Schmidt-Boelter gauge positioned at the mid height of the initiating unit in the center of the accessible means of egress.

No. 24-gauge or smaller, Type-K exposed junction thermocouples shall be installed to measure the temperature of the surface proximate to the cells and between the cells and exposed face of the initiating module. Each non-initiating module enclosure within the initiating BESS unit shall be instrumented with at least one No. 24-gauge or smaller Type-K thermocouple(s) to provide data to monitor the thermal conditions within non-initiating modules. Additional thermocouples shall be placed to account for convoluted enclosure interior geometries.

For residential use BESS, the DUT shall be covered with a single layer of cheese cloth ignition indicator. The cheesecloth shall be untreated cotton cloth running 26 – 28 m<sup>2</sup>/kg with a count of 28 – 32 threads in either direction within a 6.45 cm<sup>2</sup> (1 in<sup>2</sup>) area.

An internal fire condition in accordance with the module level test shall be created within a single module in the initiating BESS unit:

- a) The position of the module shall be selected to present the greatest thermal exposure to adjacent modules (e.g. above, below, laterally), based on the results from the module level test; and
- b) The setup (i.e. type, quantity and positioning) of equipment for initiating thermal runaway in the module shall be the same as that used to initiate and propagate thermal runaway within the module level test.

**Thermal runaway methodology for unit level test:**

The propensity of the cell to exhibit thermal runaway be demonstrated by heating the cell with externally applied heaters. With a surface heating rate of 4°C (7.2°F) to 7°C (12.6°F) per minute until cell thermal runaway occurs within the test unit.

The composition, velocity and temperature of the initiating BESS unit vent gases shall be measured within the calorimeter's exhaust duct. Gas composition shall be measured using a Fourier-Transform Infrared Spectrometer with a minimum resolution of 1 cm<sup>-1</sup> and a path length of at least 2.0 m(6.6 ft), or equivalent gas analyzer. Composition, velocity and temperature instrumentation shall be collocated with heat release rate calorimetry instrumentation.

The hydrocarbon content of the vent gas shall be measured using flame ionization detection.

The test shall be terminated if:



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 <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein 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.  
**Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com**  
 Building 13 & 14, No. 1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

- a) Temperatures measured inside each module within the initiating BESS unit return to ambient temperature;
- b) The fire propagates to adjacent units or to adjacent walls; or
- c) A condition hazardous to test staff or the test facility requires mitigation.

For residential use systems, the gas collection data gathered shall be compared to the smallest room installation specified by the manufacturer to determine if the flammable gas collected exceeds 25% LFL in air.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CEC Energy Technology (Chongqing) Co., Ltd

Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260

t (86-023) 863676001 [www.sgsgroup.com.cn](http://www.sgsgroup.com.cn)

中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260

t (86-023) 863676001 [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

Member of the SGS Group (SGS SA)

Test configuration description

Illustration of the initiating BESS unit

Description: N/A

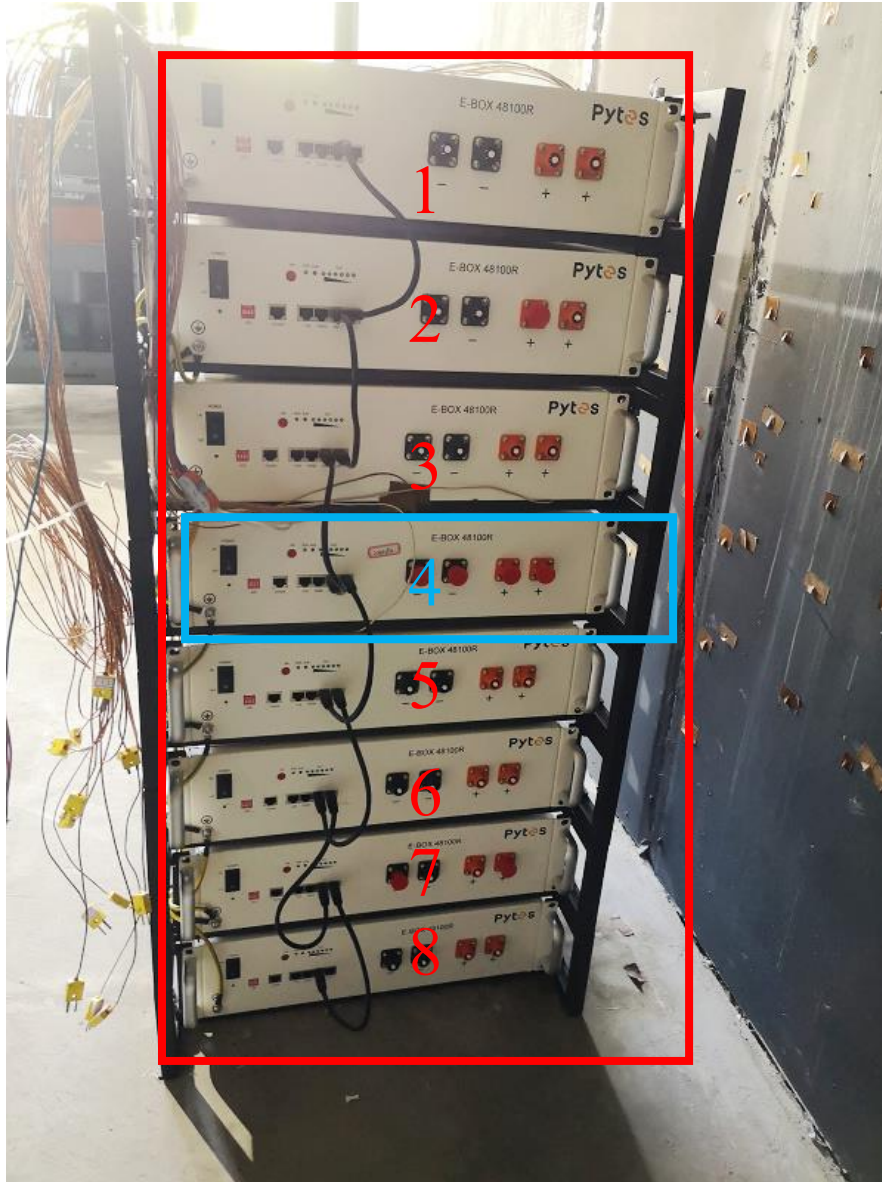


Figure 4. View of the initiating BESS unit before test.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgsgroup.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



|  |
|--|
| Thermal runaway initiation method used (including number and locations of cells for initiating thermal runaway)  |
| <p>Initiation method:<br/> External heating method was used to initiate thermal runaway. 2 heaters were used to initiate thermal runaway. Heater 1 was placed between the large surfaces of Cell 2 and Cell 3. Heater 2 was placed between the large surfaces of Cell 3 and Cell 4. Cell 3 was selected as initiating cell. Each heater was connected to one voltage regulator.</p> <p>Heater 1 and Heater 2 were energized at the same time. The working currents of Heater 1 and Heater 2 were continuously adjusted to make sure that the initiating cell was heated at a ramp of 4-7 °C/min.</p> |
| <p>Number of cells for initiating thermal runaway:<br/> <input checked="" type="checkbox"/> Single cell      100 Ah (total capacity)<br/> <input type="checkbox"/> Multiple cell      Ah (total capacity)</p>  |
| <p>Locations of cells for initiating thermal runaway: The initiating battery module consists of 2 submodules. Each submodule consists of 8 cells with a connection mode of 8S. Two submodules are connected in series. One 8S submodule (as shown in Figure 5c) is selected as the initiating submodule. heaters were placed on large face of cell 3. Cell 3 is selected as the initiating cell.</p>   |
| <p>Other description: N/A</p>  |



Figure 5a. External view of battery module.

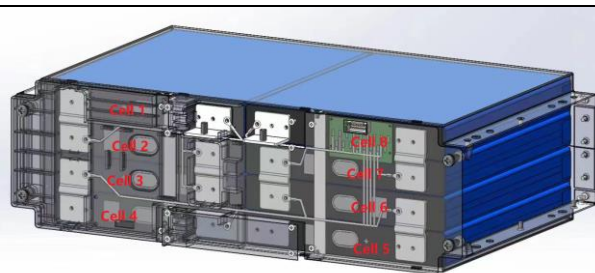


Figure 5b. Internal schematic view of battery module.



Figure 5c. Internal view 03 of battery module.

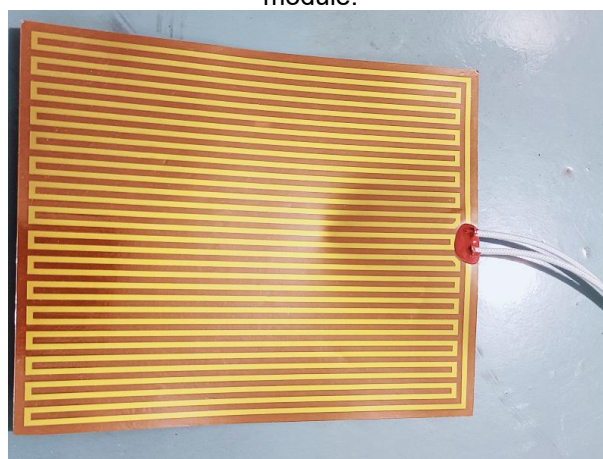


Figure 5d. View of heater.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260      t (86-023) 863676001      www.sgs.com.cn  
中国·重庆市江津区双福街道冉钧路1839号附13号、14号      邮编: 402260      t (86-023) 863676001      sgs.china@sgs.com

Member of the SGS Group (SGS SA)

Illustration of external heater and thermocouple location

Description: N/A

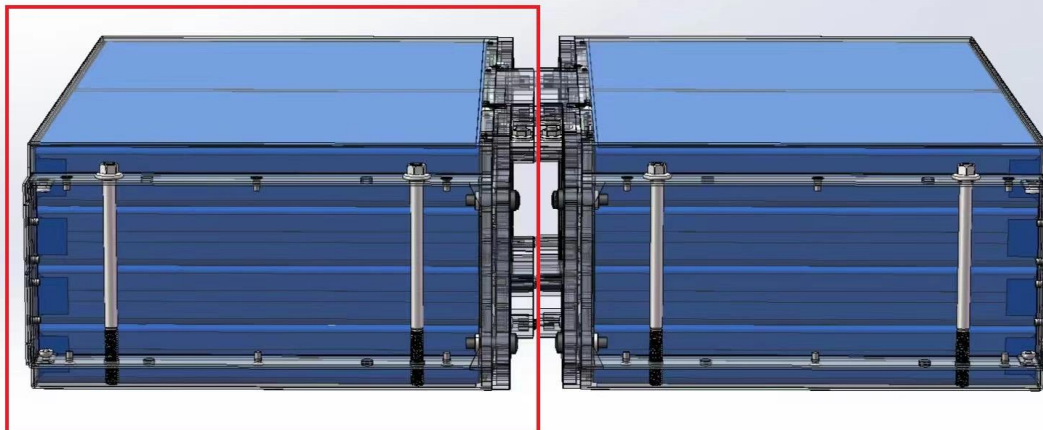


Figure 6a. Schematic diagram of initiating module.

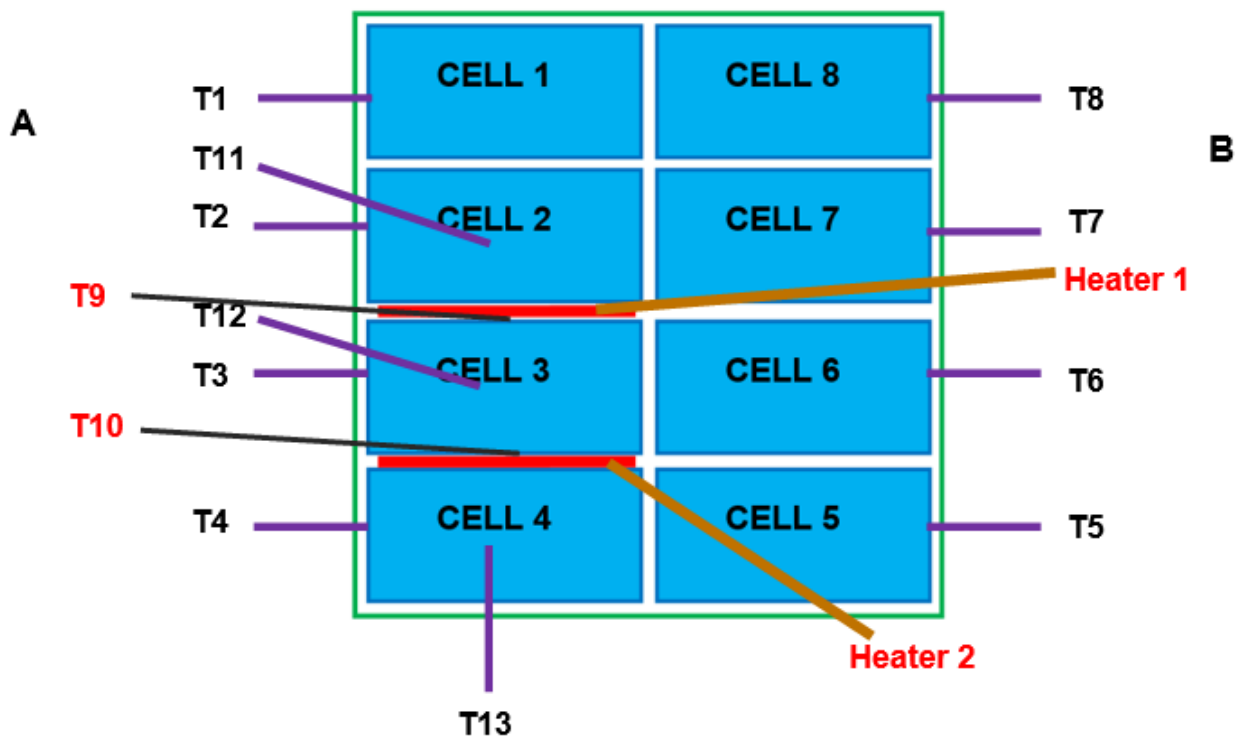


Figure 6b. Schematic diagram of external heater and thermocouple locations in the initiating module (Side view).



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.  
**Attention:** To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgsgroup.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



|   |
|---|
| Positioning of units within testing room  |
| Test Start Time: 2022-08-09 14:42:00      |
| Initial Ambient Test Temperature: 28.8 °C |
| Initial Relative Humidity: 58%            |
| Description: N/A                          |

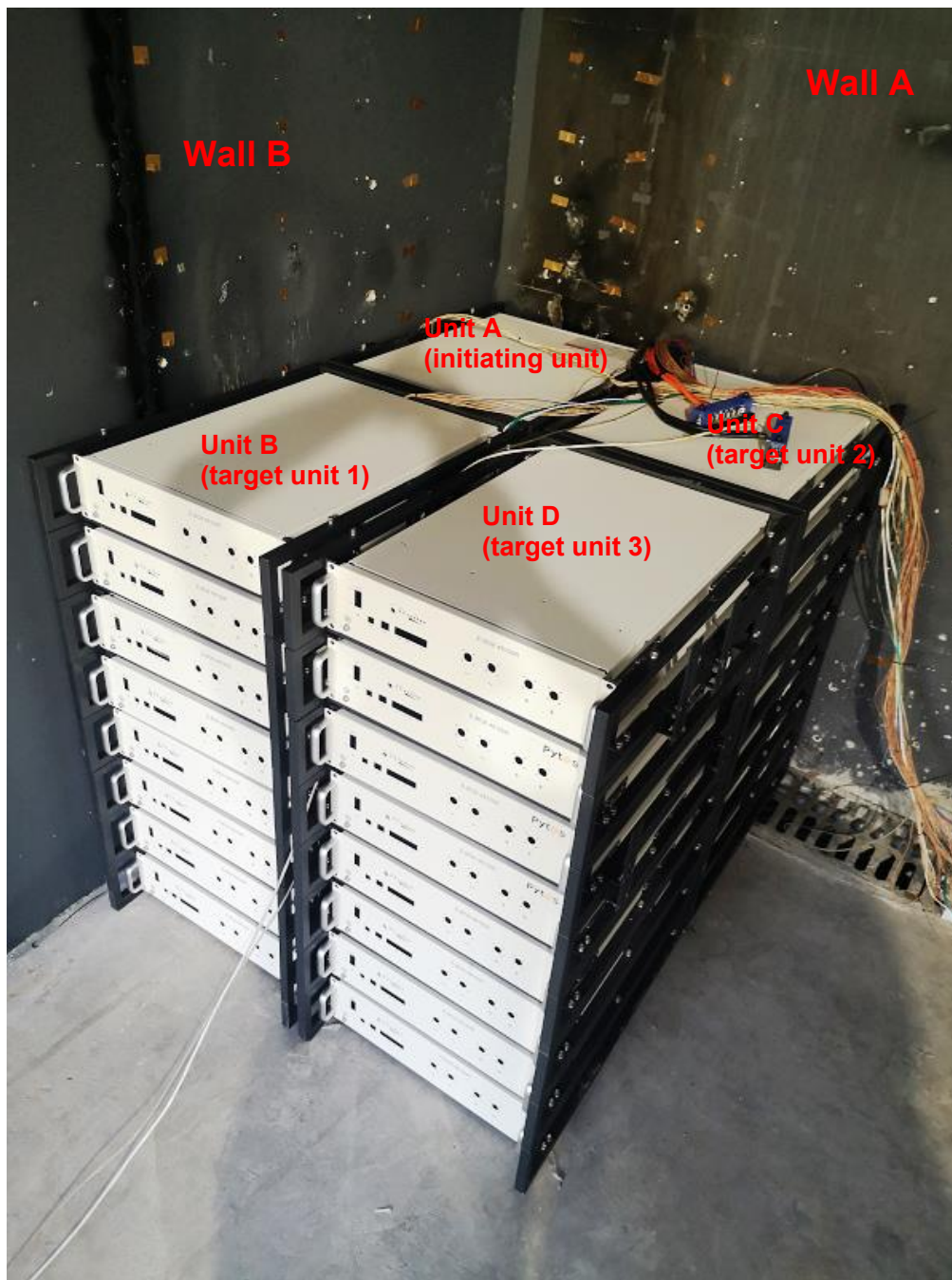


Figure 7. View of BESS within test room.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.  
**Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com**  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgsgroup.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



Table 6: Thermocouple placement

| Thermocouple ID | Description of location                                    | Remark                    |
|-----------------|--|---------------------------|
| CH2501          | Side surface A of Cell 1                                   | T1, in initiating module  |
| CH2502          | Side surface A of Cell 2                                   | T2, in initiating module  |
| CH2503          | Side surface A of Cell 3                                   | T3, in initiating module  |
| CH2504          | Side surface A of Cell 4                                   | T4, in initiating module  |
| CH2505          | Side surface B of Cell 5                                   | T5, in initiating module  |
| CH2506          | Side surface B of Cell 6                                   | T6, in initiating module  |
| CH2507          | Side surface B of Cell 7                                   | T7, in initiating module  |
| CH2508          | Side surface B of Cell 8                                   | T8, in initiating module  |
| CH2509          | Large surface of cell 3, between cell surface and Heater 1 | T9, in initiating module  |
| CH2510          | Large surface of cell 3, between cell surface and Heater 2 | T10, in initiating module |
| CH3001          | Bottom surface of cell 2                                   | T11, in initiating module |
| CH3002          | Bottom surface of cell 3                                   | T12, in initiating module |
| CH3003          | Bottom surface of cell 4                                   | T13, in initiating module |
| CH2001          | No. 1 of wall B  | WB-1                      |
| CH2002          | No. 2 of wall B  | WB-2                      |
| CH2003          | No. 3 of wall B  | WB-3                      |
| CH2004          | No. 4 of wall B  | WB-4                      |
| CH2005          | No. 5 of wall B  | WB-5                      |
| CH2006          | No. 6 of wall B  | WB-6                      |
| CH2007          | No. 7 of wall B  | WB-7                      |
| CH2008          | No. 8 of wall B  | WB-8                      |
| CH2009          | No. 9 of wall B  | WB-9                      |
| CH2010          | No. 10 of wall B   | WB-10                     |
| CH2101          | No. 11 of wall B   | WB-11                     |
| CH2102          | No. 12 of wall B   | WB-12                     |
| CH2103          | No. 13 of wall B   | WB-13                     |
| CH2104          | No. 14 of wall B   | WB-14                     |
| CH2105          | No. 15 of wall B   | WB-15                     |
| CH2106          | No. 16 of wall B   | WB-16                     |
| CH2107          | No. 17 of wall B   | WB-17                     |
| CH2108          | No. 18 of wall B   | WB-18                     |



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

|        |                  |       |
|--------|------------------|-------|
| CH2109 | No. 19 of wall B | WB-19 |
| CH2110 | No. 20 of wall B | WB-20 |
| CH2201 | No. 21 of wall B | WB-21 |
| CH2202 | No. 22 of wall B | WB-22 |
| CH2203 | No. 23 of wall B | WB-23 |
| CH2204 | No. 24 of wall B | WB-24 |
| CH1001 | No. 25 of wall B | WB-25 |
| CH1002 | No. 26 of wall B | WB-26 |
| CH1003 | No. 27 of wall B | WB-27 |
| CH1004 | No. 28 of wall B | WB-28 |
| CH1005 | No. 29 of wall B | WB-29 |
| CH1006 | No. 30 of wall B | WB-30 |
| CH1007 | No. 31 of wall B | WB-31 |
| CH1008 | No. 32 of wall B | WB-32 |
| CH1009 | No. 33 of wall B | WB-33 |
| CH1010 | No. 34 of wall B | WB-34 |
| CH1101 | No. 35 of wall B | WB-35 |
| CH1102 | No. 36 of wall B | WB-36 |
| CH1103 | No. 37 of wall B | WB-37 |
| CH1104 | No. 38 of wall B | WB-38 |
| CH1105 | No. 39 of wall B | WB-39 |
| CH1106 | No. 40 of wall B | WB-40 |
| CH1107 | No. 41 of wall B | WB-41 |
| CH1108 | No. 42 of wall B | WB-42 |
| CH1201 | No. 43 of wall B | WB-43 |
| CH1202 | No. 44 of wall B | WB-44 |
| CH1203 | No. 45 of wall B | WB-45 |
| CH1204 | No. 46 of wall B | WB-46 |
| CH1205 | No. 47 of wall B | WB-47 |
| CH1206 | No. 48 of wall B | WB-48 |
| CH1207 | No. 49 of wall B | WB-49 |
| CH1208 | No. 50 of wall B | WB-50 |



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 <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

Building 13 & 14, No. 1839, Ranjun Road, Shuangfu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

|        |                  |       |
|--------|------------------|-------|
| CH1209 | No. 51 of wall B | WB-51 |
| CH1210 | No. 52 of wall B | WB-52 |
| CH1301 | No. 53 of wall B | WB-52 |
| CH1302 | No. 54 of wall B | WB-54 |
| CH0001 | No. 1 of wall A  | WA-1  |
| CH0002 | No. 2 of wall A  | WA-2  |
| CH0003 | No. 3 of wall A  | WA-3  |
| CH0004 | No. 4 of wall A  | WA-4  |
| CH0005 | No. 5 of wall A  | WA-5  |
| CH0006 | No. 6 of wall A  | WA-6  |
| CH0007 | No. 7 of wall A  | WA-7  |
| CH0009 | No. 8 of wall A  | WA-8  |
| CH0010 | No. 9 of wall A  | WA-9  |
| CH0101 | No. 10 of wall A | WA-10 |
| CH0103 | No. 11 of wall A | WA-11 |
| CH0104 | No. 12 of wall A | WA-12 |
| CH0105 | No. 13 of wall A | WA-13 |
| CH0106 | No. 14 of wall A | WA-14 |
| CH0107 | No. 15 of wall A | WA-15 |
| CH0108 | No. 16 of wall A | WA-16 |
| CH0109 | No. 17 of wall A | WA-17 |
| CH0110 | No. 18 of wall A | WA-18 |
| CH0201 | No. 19 of wall A | WA-19 |
| CH0202 | No. 20 of wall A | WA-20 |
| CH0203 | No. 21 of wall A | WA-21 |
| CH0204 | No. 22 of wall A | WA-22 |
| CH2205 | No. 23 of wall A | WA-23 |
| CH2206 | No. 24 of wall A | WA-24 |
| CH2207 | No. 25 of wall A | WA-25 |
| CH2208 | No. 26 of wall A | WA-26 |
| CH2209 | No. 27 of wall A | WA-27 |
| CH2210 | No. 28 of wall A | WA-28 |



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 <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No. 1839, Ranjun Road, Shuangfu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



|        |                                      |       |
|--------|--------------------------------------|-------|
| CH2301 | No. 29 of wall A                     | WA-29 |
| CH2302 | No. 30 of wall A                     | WA-30 |
| CH2303 | No. 31 of wall A                     | WA-31 |
| CH2304 | No. 32 of wall A                     | WA-32 |
| CH2305 | No. 33 of wall A                     | WA-33 |
| CH2306 | No. 34 of wall A                     | WA-34 |
| CH2307 | No. 35 of wall A                     | WA-35 |
| CH2401 | No. 36 of wall A                     | WA-36 |
| CH2402 | No. 37 of wall A                     | WA-37 |
| CH2403 | No. 38 of wall A                     | WA-38 |
| CH2404 | No. 39 of wall A                     | WA-39 |
| CH2405 | No. 40 of wall A                     | WA-40 |
| CH2406 | No. 41 of wall A                     | WA-41 |
| CH2407 | No. 42 of wall A                     | WA-42 |
| CH2408 | No. 43 of wall A                     | WA-43 |
| CH3004 | Bottom surface of module 1 in unit A | TA1   |
| CH3005 | Bottom surface of module 2 in unit A | TA2   |
| CH3006 | Bottom surface of module 3 in unit A | TA3   |
| CH3007 | Top surface of module 4 in unit A    | TA4   |
| CH3008 | Left surface of module 4 in unit A   | TA5   |
| CH3009 | Right surface of module 4 in unit A  | TA6   |
| CH3101 | Rear surface of module 4 in unit A   | TA7   |
| CH3102 | Bottom surface of module 4 in unit A | TA8   |
| CH3103 | Top surface of module 5 in unit A    | TA9   |
| CH3104 | Top surface of module 6 in unit A    | TA10  |
| CH3105 | Top surface of module 7 in unit A    | TA11  |
| CH3106 | Top surface of module 8 in unit A    | TA12  |
| CH3304 | Rear surface of module 1 in unit B   | TB1   |
| CH3206 | Rear surface of module 2 in unit B   | TB2   |
| CH3207 | Rear surface of module 3 in unit B   | TB3   |
| CH3208 | Rear surface of module 4 in unit B   | TB4   |
| CH3209 | Rear surface of module 5 in unit B   | TB5   |



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 <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CEC Energy Technology (Chongqing) Co., Ltd. Building 13 & 14, No. 1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

|  |                                     |     |
|--|-------------------------------------|-----|
| CH3210                                   | Rear surface of module 6 in unit B  | TB6 |
| CH3301                                   | Rear surface of module 7 in unit B  | TB7 |
| CH3302                                   | Rear surface of module 8 in unit B  | TB8 |
| CH3107                                   | Right surface of module 1 in unit C | TC1 |
| CH3108                                   | Right surface of module 2 in unit C | TC2 |
| CH3109                                   | Right surface of module 3 in unit C | TC3 |
| CH3110                                   | Right surface of module 4 in unit C | TC4 |
| CH3201                                   | Right surface of module 5 in unit C | TC5 |
| CH3202                                   | Right surface of module 6 in unit C | TC6 |
| CH3203                                   | Right surface of module 7 in unit C | TC7 |
| CH3204                                   | Right surface of module 8 in unit C | TC8 |
| CH1-2-15                                 | Ambient                             | --  |
| Thermocouple information: Type K, 24AWG. |                                     |     |



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CEC Energy Technology (Chongqing) Co., Ltd

Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260

t (86-023) 863676001 www.sgsgroup.com.cn

中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260

t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

[Description of test results]

Table 7: Overview of test timeline and key events

| Time (HH: MM: SS) | Relative Time (HH: MM: SS) | Event ID | Event                           | Description  | Photo Reference |
|-------------------|----------------------------|----------|---------------------------------|--|-----------------|
| 14:42:00          | 0:00:00                    | E1       | Test Start                      | --   | Figure 12       |
| 14:42:30          | 0:00:30                    | E2       | Heater 1 and Heater 2 Energized | --   | --              |
| 15:28:26          | 0:46:26                    | E3       | Release                         | Smoke release observed from initiating battery system enclosure. | Figure 13       |
| 16:15:01          | 1:33:01                    | E4       | Release                         | Smoke release observed from initiating battery system enclosure. | Figure 14       |
| 18:42:00          | 4:00:00                    | E5       | Test Termination                | --   | --              |

|   |
|---|
| Chemical heat release rate versus time                                  |
| Description: No flaming extension observed outside the initiating unit. |
| N/A   |

|   |
|---|
| Convective heat release rate (HRRc) versus time |
| Description: N/A                                |

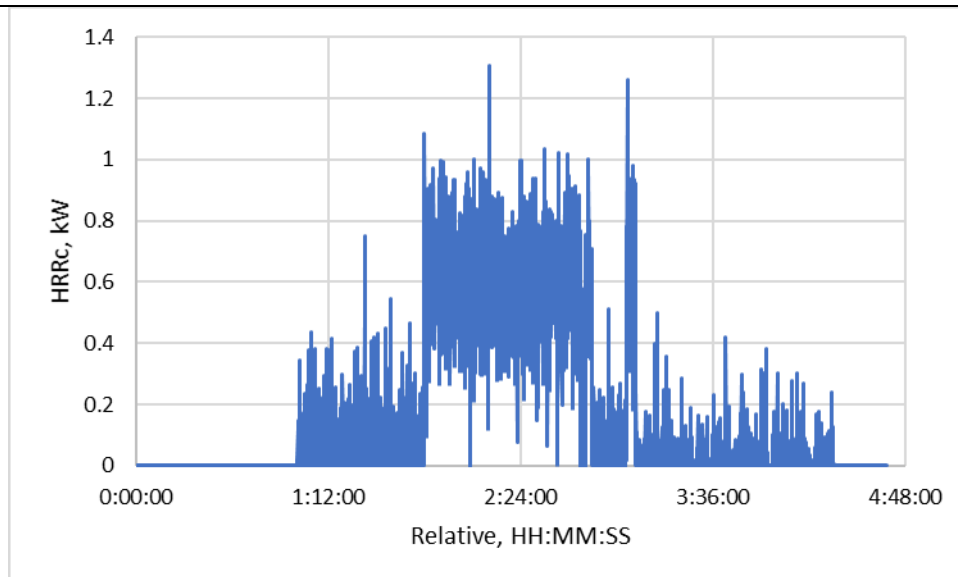


Figure 8. Convective heat release rate versus time



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

Building 13 & 14, No.1839, Ranjun Road, Shuangtu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

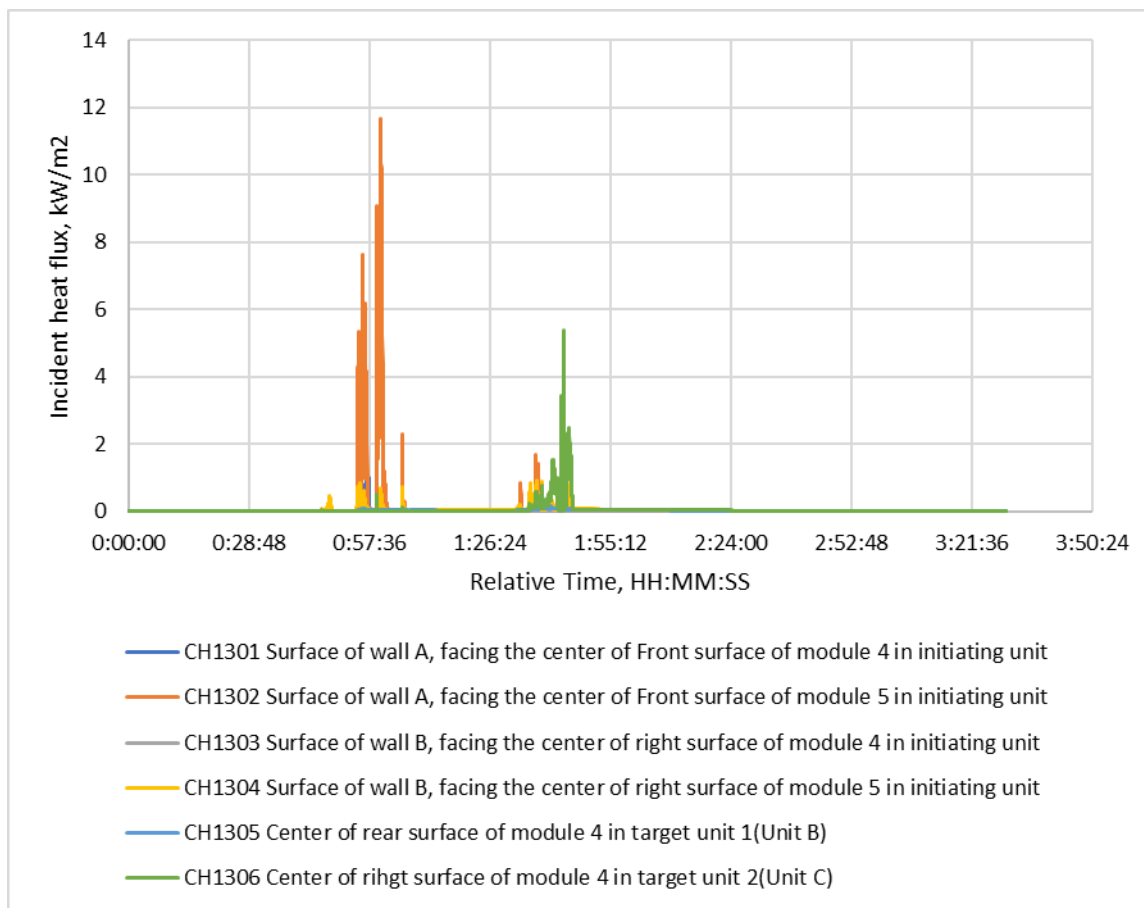
Member of the SGS Group (SGS SA)



Maximum incident heat flux on target units and wall surfaces

Result:

| Heat Flux Sensor ID | Description of location  |
|---------------------|--|
| CH1301              | Surface of wall A, facing the center of front surface of module 4 in initiating unit |
| CH1302              | Surface of wall A, facing the center of front surface of module 5 in initiating unit |
| CH1303              | Surface of wall B, facing the center of right surface of module 4 in initiating unit |
| CH1304              | Surface of wall B, facing the center of right surface of module 5 in initiating unit |
| CH1305              | Center of rear surface of module 4 in target unit 1(Unit B)                          |
| CH1306              | Center of rihgt surface of module 4 in target unit 2(Unit C)                         |



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

Peak smoke release rate and total smoke release

Result:

1. Peak smoke release rate is 1.340 m<sup>2</sup>/s during test.
2. Total smoke release is 1181 m<sup>2</sup> during test.

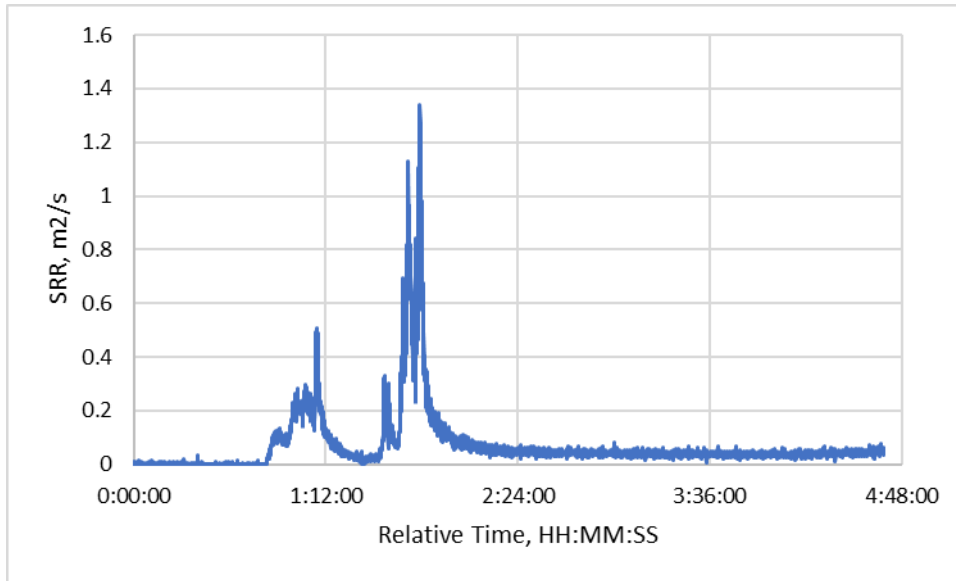


Figure 10. Smoke release rate versus time.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgsgroup.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

|   |   |
|---|---|
| Flammable gas generation and composition                            |   |
| Flammable gas generation:   | <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO |
| Flammable gas content $\geq$ 25% of LFL or not:                     | N/A.  |
| Description :   |   |
| Total gas generation during test: 1769 L (25°C, 101kPa)             |   |
| Recommend smallest room for installation: $\geq$ 142 m <sup>3</sup> |   |

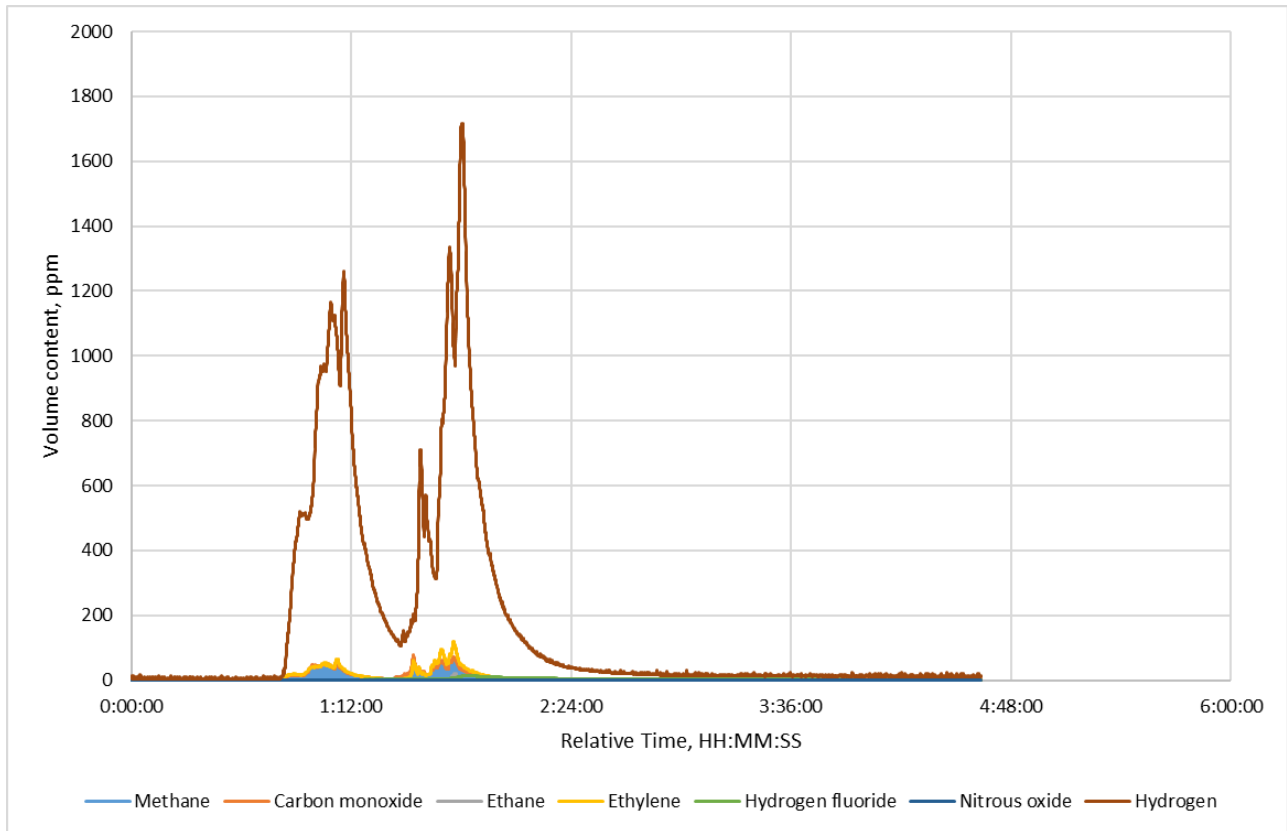


Figure 11. Online flammable gas content measurements during test. (Remark: The content of other hydrocarbons is below the detection limit of the test equipment.)



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CEC Energy Technology (Chongqing) Co., Ltd. Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgsgroup.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



|   |
|---|
| Locations and visual estimations of flame extension and duration from the unit        |
| Flame extension : <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO |
| Description : No external flaming observed.   |
| N/A   |

Table 9: Data during test

| Module ID  | OCV of Battery Module Before Test, (V dc)                           | OCV of Battery Module After Test, (V dc) | Observation Results   |
|--|---|--|---|
| Module 1 of initiatig unit   | 53.315  | 53.315                                   | No gas venting observed. No external flaming observed.  |
| Module 2 of initiatig unit   | 53.315  | 53.315                                   | No gas venting observed. No external flaming observed.  |
| Module 3 of initiatig unit   | 53.320  | 53.315                                   | No gas venting observed. No external flaming observed.  |
| Module 4 of initiatig unit   | 53.320  | 0  | Gas and smoke venting observed. No external flaming observed. No flying debris observed. No explosion observed. |
| Module 5 of initiatig unit   | 53.320  | 53.315                                   | No gas venting observed. No external flaming observed.  |
| Module 6 of initiatig unit   | 53.320  | 53.320                                   | No gas venting observed. No external flaming observed.  |
| Module 7 of initiatig unit   | 53.320  | 53.320                                   | No gas venting observed. No external flaming observed.  |
| Module 8 of initiatig unit   | 53.320  | 53.320                                   | No gas venting observed. No external flaming observed.  |
| Measured Maximum Temperature Rise of Wall Surface  |   |  |   |
| Thermocouple ID  | CH2304  |  |   |
| Measurements, (°C)   | 122.9 (temperature rise 94.3 °C)                                    |  |   |
| Location   | Surface of wall A   |  |   |
| Limits: $\Delta T \leq 97$ °C  |   |  |   |
| Measured Maximum Surface Temperature of Modules within the Target BESS Units                             |   |  |   |
| Thermocouple ID  | CH3208  |  |   |
| Measurements, (°C)   | 158.1   |  |   |
| Location   | Rear surface of module 4 in unit B                                  |  |   |
| Limits: Tmax. $\leq 209.4$ °C  |   |  |   |
| Cheesecloth indicator used or not  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |  |   |
| Description of cheesecloth indicator after test: No flaming or carbonizing of the cheesecloth indicator. |   |  |   |
| Supplementary information: N/A   |   |  |   |



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

Building 13 & 14, No. 1839, Ranjun Road, Shuangfu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com



Figure 12. Photo 01 of initiating BESS unit and target BESS units during test.



Figure 13. Photo 02 of initiating BESS unit and target BESS units during test.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.  
**Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com**  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

2022年08月09日 星期二 16:15:01



Figure 14. Photo 03 of initiating BESS unit and target BESS units during test.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260

t (86-023) 863676001 www.sgsgroup.com.cn  
 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)





Figure 15. Photo 01 of initiating BESS unit and target BESS units after test.



Figure 16. Photo 02 of initiating BESS unit and target BESS units after test.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260

t (86-023) 863676001

[www.sgs.com](http://www.sgs.com)

中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260

t (86-023) 863676001

[sgs.china@sgs.com](mailto:sgs.china@sgs.com)

Member of the SGS Group (SGS SA)





Figure 17. Photo 03 of initiating BESS unit and target BESS units after test.

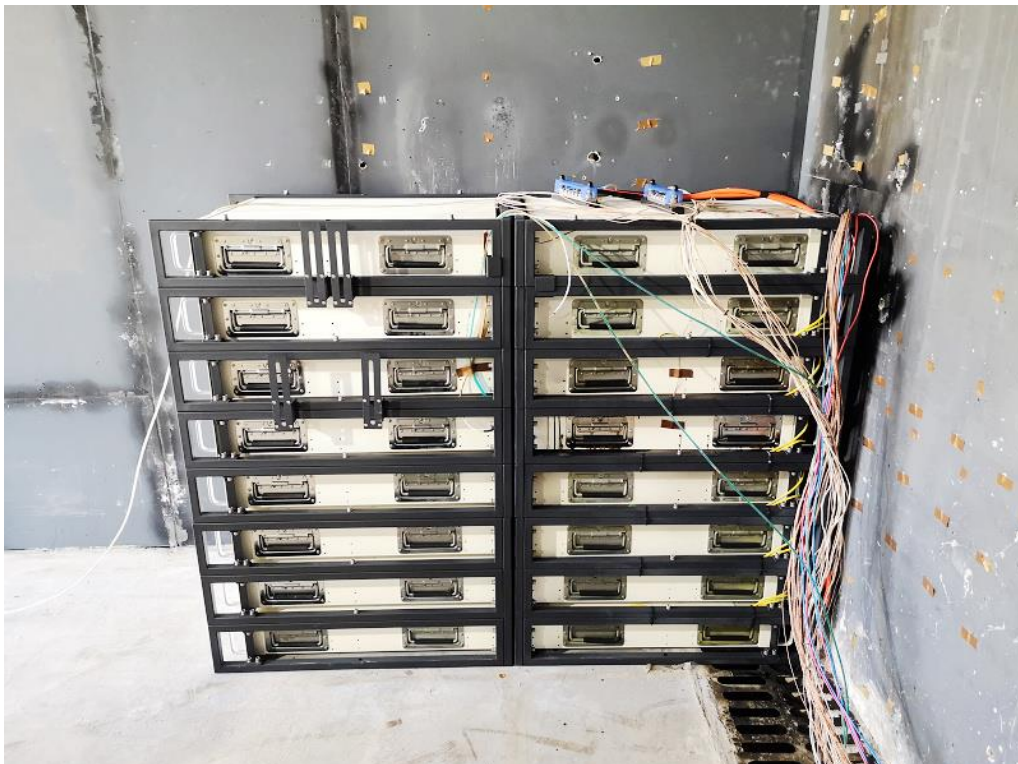


Figure 18. Photo 04 of initiating BESS unit and target BESS units after test.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



Figure 19. Photo 01 of initiating BESS unit after test.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgsgroup.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)





Figure 20. Photo 02 of initiating BESS unit after test.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



Figure 21a. Photo of initiating battery module after test.



Figure 21b. Photo 01 of thermal runaway location.

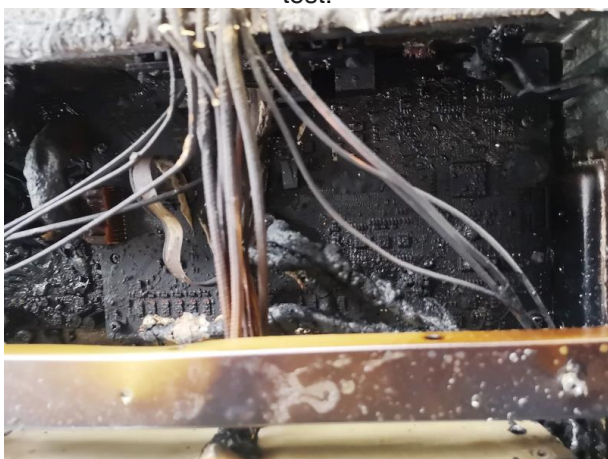


Figure 21c. Photo 02 of thermal runaway location.

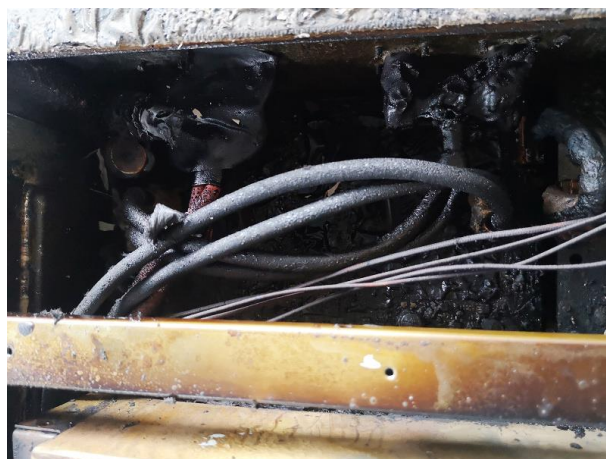


Figure 21d. Photo 03 of thermal runaway location.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260

t (86-023) 863676001 www.sgsgroup.com.cn

中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260

t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)



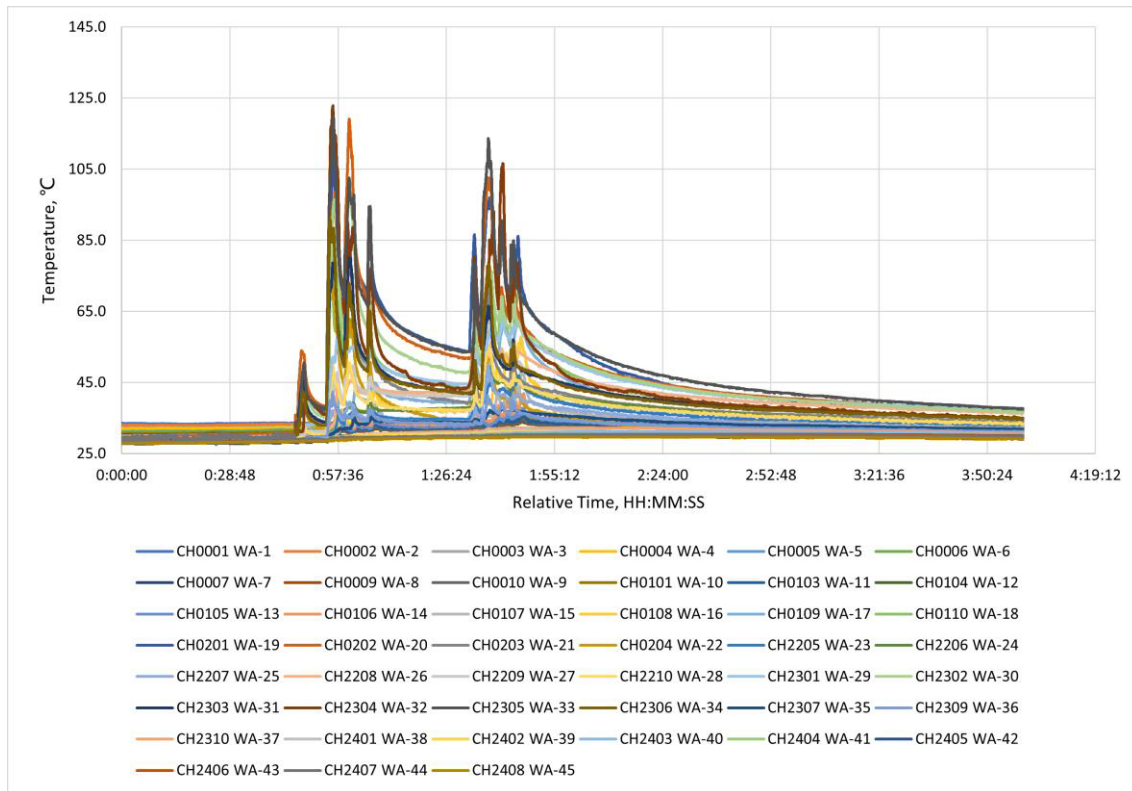


Figure 22. Temperature measurement results on wall A.

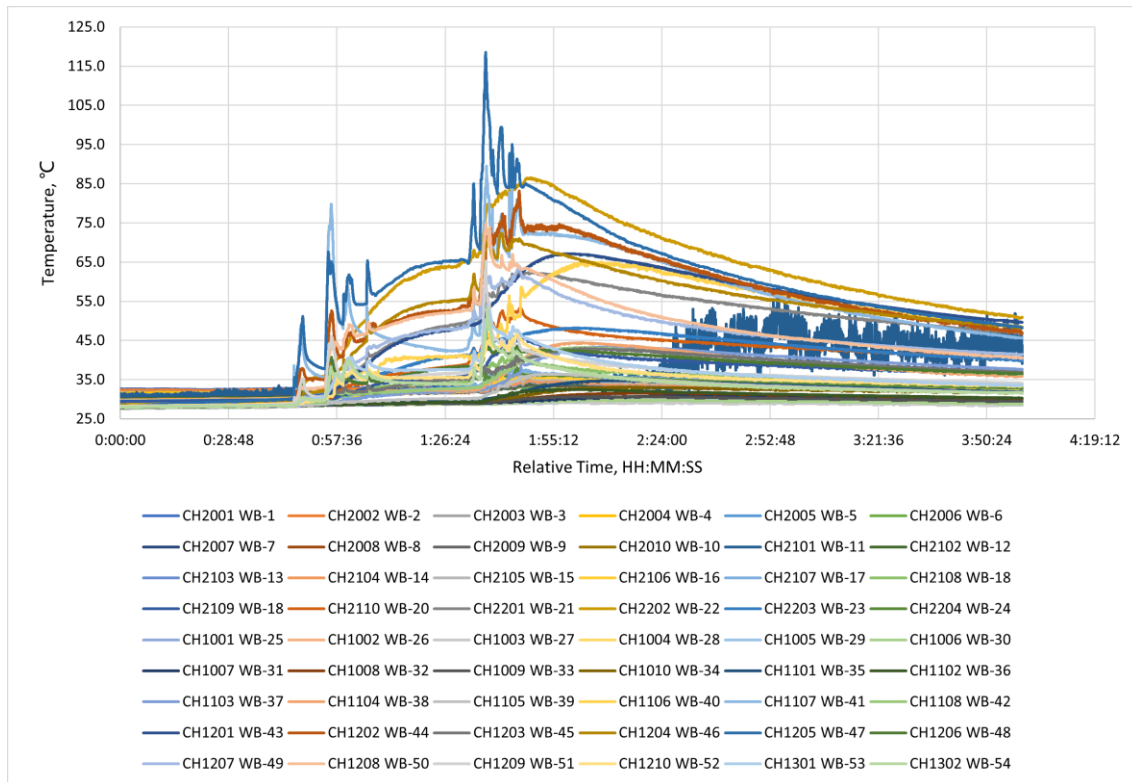


Figure 23. Temperature measurement results on wall B.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com



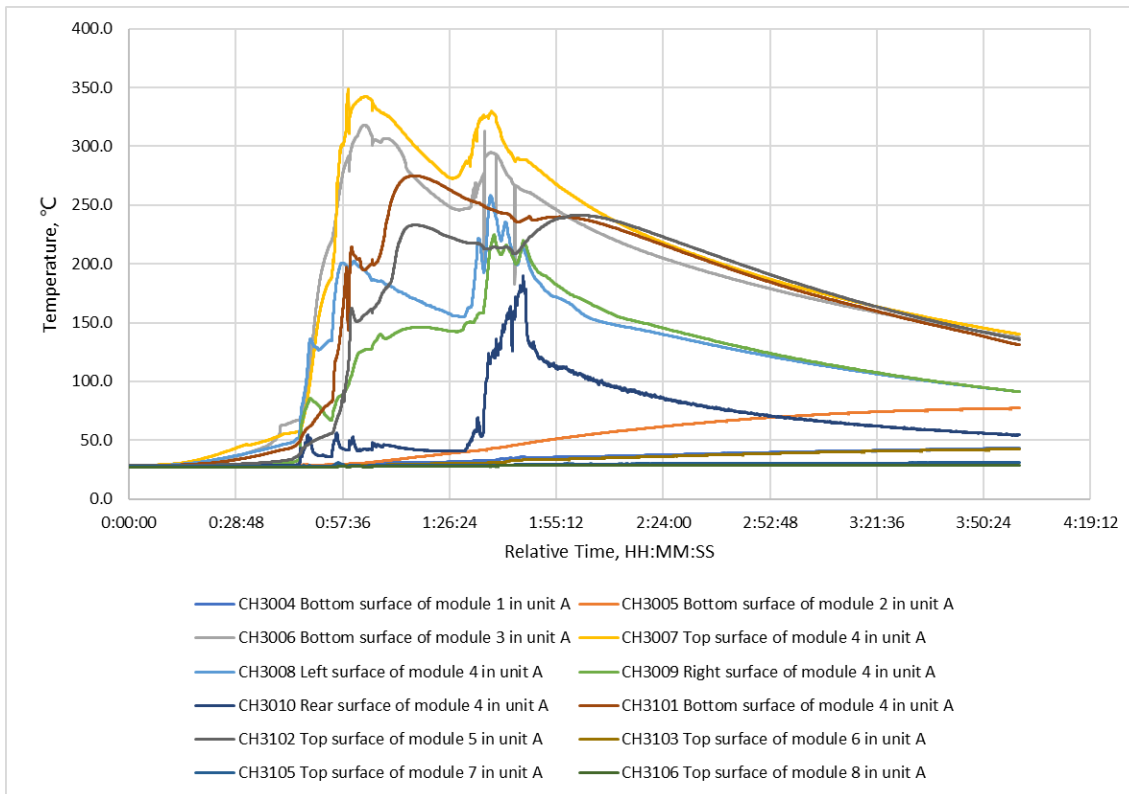


Figure 24. Temperature measurement results on the initiating unit (unit A).

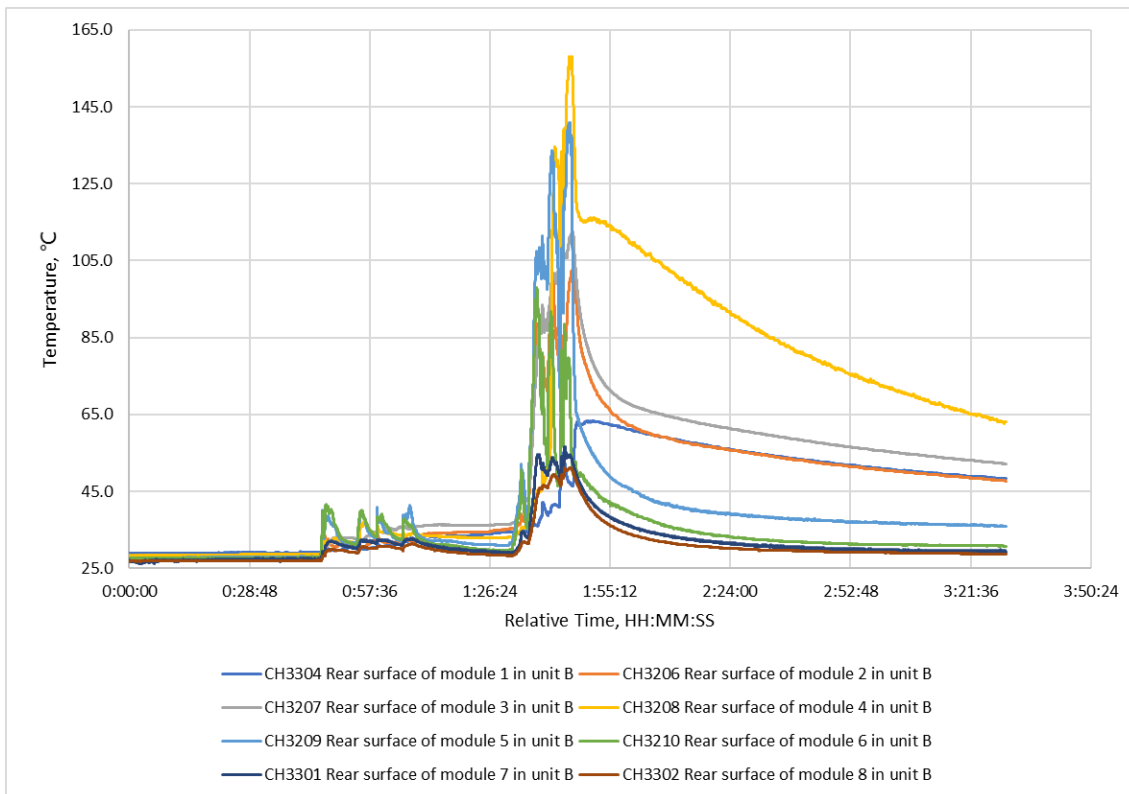


Figure 25. Temperature measurement results on target units (Unit B)



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

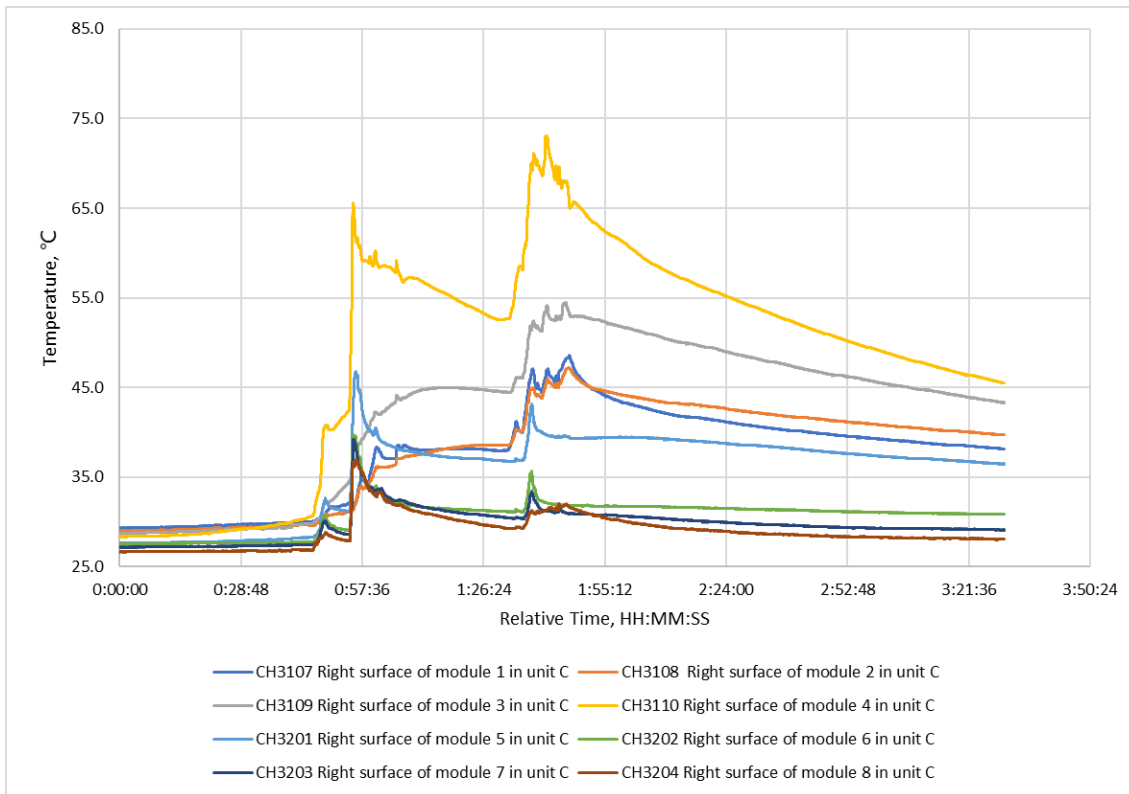


Figure 26. Temperature measurement results on target units (Unit C)

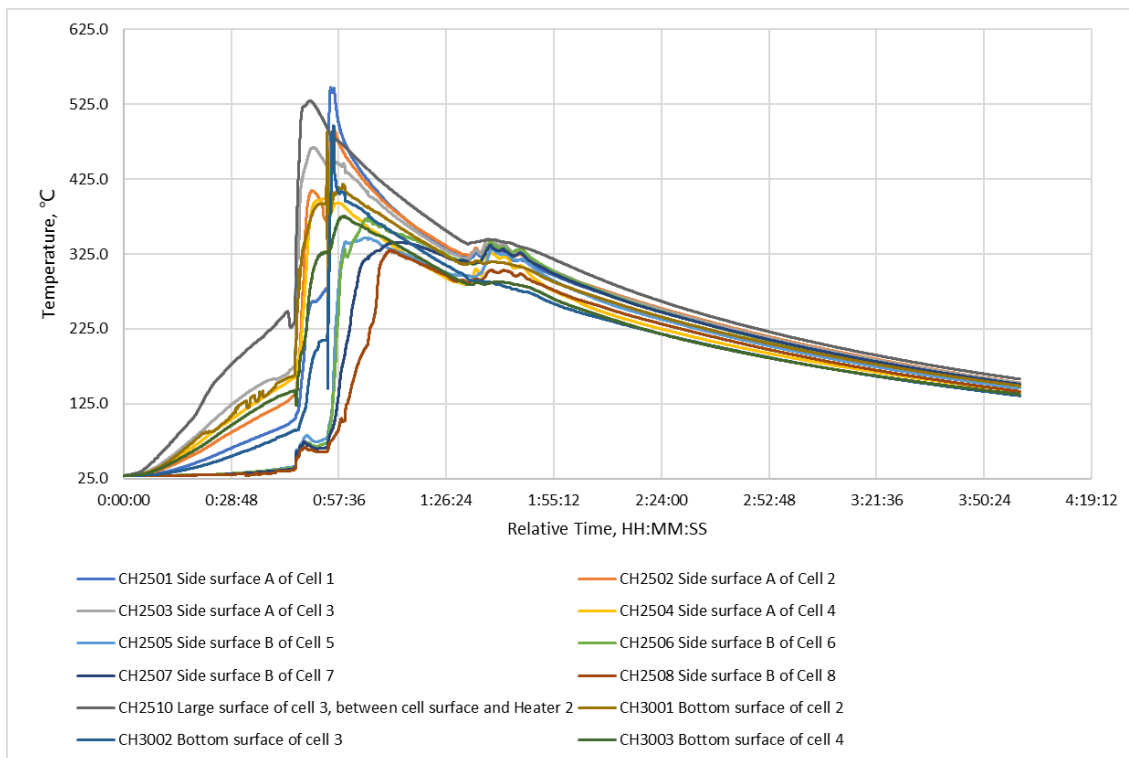


Figure 27. Temperature measurement results on the initiating module.



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)  
 Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 t (86-023) 863676001 www.sgs.com.cn  
 中国·重庆市江津区双福街道冉钧路1839号附13号、14号 邮编: 402260 t (86-023) 863676001 sgs.china@sgs.com

Member of the SGS Group (SGS SA)

**NOTES TO THIS TEST REPORT**

1. Copyright © 2021 SGS-CEC New Energy Technology (Chongqing) Co., Ltd. All rights reserved. This publication may be produced in whole or in part for non-commercial purposes as long as SGS-CEC is acknowledged as copyright owner and source of the material. SGS-CEC takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.
2. According to the standard, instruction sheets and other texts required by the standard should be written in the official language(s) of the country in which the product is to be sold. The applicant should ensure that the product in future production fulfils the receptive standard requirements.
3. The components performed satisfactorily during testing and are considered to be suitable for use in the sample tested.

- - - End of Report - - -



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 <https://www.sgs.com/en/Terms-and-Conditions>. 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.

**Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com**

|  |   |                      |                   |
|--|---|----------------------|-------------------|
| SGS-CEC New Energy Technology (Chongqing) Co., Ltd | Building 13 & 14, No.1839, Ranjun Road, Shuanglu Street, Jiangjin District, Chongqing, China 402260 | t (86-023) 863676001 | www.sgs.com       |
| 中国·重庆市江津区双福街道冉钧路1839号附13号、14号                      | 邮编: 402260  | t (86-023) 863676001 | sgs.china@sgs.com |

Member of the SGS Group (SGS SA)