

VECOW CO., LTD.

3F., NO.10, JIANKANG RD., ZHONGHE DIST., NEW TAIPEI CITY 23586, TAIWAN

Sample Description: HIGH-PERFORMANCE FANLESS SYSTEM

Item No.: IVX-1000-ICY

Other: IVX-1 XXXXXXXXXXXXXXXX ("X" CAN BE 0-9, A-Z OR BLANK FOR MARKETING PURPOSE)

The above data and information was / were submitted and identified on behalf of the client. SGS is not responsible for the authenticity, integrity and results of the data and information and / or the validity of the conclusion.

SGS Ref No.: XMIN2312001593CM01

Sample Receiving Date: Dec.11, 2023

Test Performing Date: Dec.11, 2023 to Mar.29, 2024

Test Requested:

Assessment on the fire performance of "Compliant HL3", which defined in EN 45545-2:2020+A1:2023 Railway applications—Fire protection on railway vehicles Part 2: Requirements for fire behaviour of materials and components, for the "High-Performance Fanless System"

Test Results: -- See attached sheet --

Signed for and on behalf of
Shunde Branch
SGS-CSTC Co., Ltd.



Scan to see the report



SDFS2312007919FF
Verification:
check.sgsnline.com.cn

Daniel Guan
Approved signatory



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

1-2/F, Building 1, European Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China 528300

t (86-757) 22805888

www.sgsgroup.com.cn

中国·广东·佛山市顺德区大良街道办事处五沙社区居民委员会顺和南路1号欧洲工业园一号厂房首层、二层 邮编: 528300

t (86-757) 22805888

sgs.china@sgs.com

I. Introduction

This assessment report is for appraisal on “High-Performance Fanless System”.

This assessment report presents an assessment of the ability of the “High-Performance Fanless System” and whether it is acceptable applied in the scope which required the fire performance HL2, as the product used in railway vehicles, specified in EN 45545-2:2020+A1:2023.

II. References

In this document the “High-Performance Fanless System” applied by VECOW CO., LTD. will be evaluated in respect of conformity to the generally recognized codes of practice. The assessment is based on the following standards:

1. EN 45545-1:2013 Railway applications - Fire protection on railway vehicles – Part 1: General.
2. EN 45545-2:2020+A1:2023 Railway applications—Fire protection on railway vehicles Part 2: Requirements for fire behaviour of materials and components.
3. 96/603/EC Commission decision of 4 October 1996, establishing the list of products to Class A “No contribution to fire” provided for in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products.
4. EN ISO 4589-2:2017 Plastics – Determination of burning behaviour by oxygen index – Part 2: Ambient-temperature test.
5. EN 60695-2-11:2014 Fire hazard testing — Part 2-11:Glowing/hot-wire based test methods Glow-wire flammability test method for end-products
6. ANSI/UL 94 Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

III. Product details of assessed

Part 1, General

The details of the tested specimen given below have been prepared from information provided by the sponsor of the test. All values quoted are nominal, unless tolerances are given.

| | |
|-----------------------|-----------------------------------|
| Sample Name | High-Performance Fanless System |
| Product specification | IVX-1000-ICY |
| Overall Size | 360mm (L) × 230mm (W) × 102mm (H) |
| Weight | About 10450 g |
| End use | Railway Vehicle |



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

1-2/F, Building 1, European Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China 528300 t (86-757) 22805888 www.sgs.com.cn
 中国·广东·佛山市顺德区大良街道办事处五沙社区居民委员会顺和南路1号欧洲工业园一号厂房首层、二层 邮编: 528300 t (86-757) 22805888 sgs.china@sgs.com

The “High-Performance Fanless System” is an electro technical product. The construction combines elements made of metal shell, PCB boards, wires, thermal conductive adhesive and other metallic parts. The major mass of non-metallic materials is used for the PCB boards, thermal conductive adhesive and wire connectors etc.

A list of materials is shown in the follow materials table provided by the manufacturer.

| High-Performance Fanless System | | | | |
|---------------------------------|----------------------------------|--------------|---------|----------------------------------------------------------|
| NO. | Description | Material | Mass, g | Remark |
| 1 | Product shell (upper) | Metal | 1412.6 | / |
| 2 | Product shell (below) | Metal | 2996.6 | / |
| 3 | Product shell (side) | Metal | 555.2 | / |
| 4 | Other metal components | Metal | 4134.1 | / |
| 5 | PCB 1+2 | Non-metallic | 967.8 | With the technical equipment on the PCB |
| 6 | PCB 3 | Non-metallic | 69.2 | With the technical equipment on the PCB |
| 7 | Wire connectors | Non-metallic | 54 | / |
| 8 | Wire insulation layer | Non-metallic | 69 | Non-metallic insulating sheath and inner metal wire core |
| 9 | Wire metal core | Metal | 51 | / |
| 10 | Gery thermal conductive adhesive | Non-metallic | 44.3 | / |
| 11 | Blue thermal conductive adhesive | Non-metallic | 69.2 | / |



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

1-2F, Building 1, European Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China 528300
 中国·广东·佛山市顺德区大良街道办事处五沙社区居民委员会顺和南路1号欧洲工业园一号厂房首层、二层 邮编: 528300

t (86-757) 22805888 www.sgsgroup.com.cn
 t (86-757) 22805888 sgs.china@sgs.com

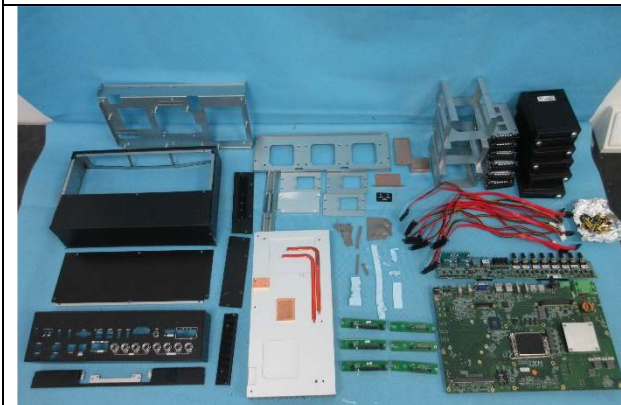
High-Performance Fanless System



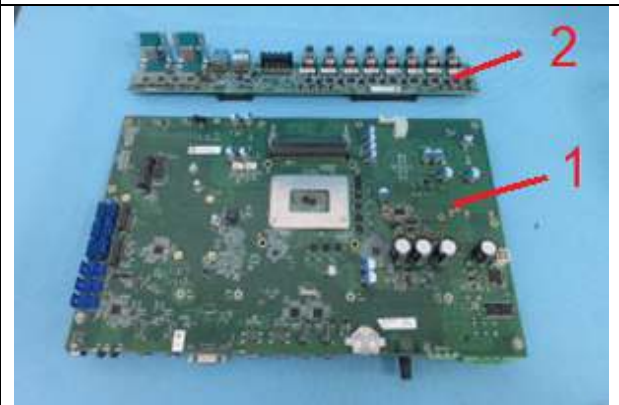
Product



Parts of product



Parts of product



PCB 1&2 (No.5)



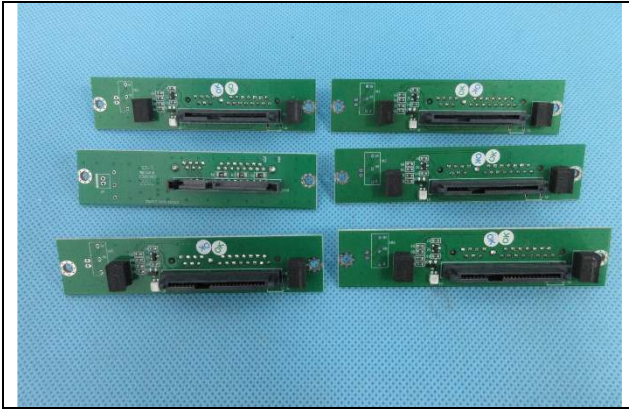
Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction 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-CS Standards Technical Services (Shunde) Ltd
Shunde Branch / 佛山顺德分公司

1-2/F, Building 1, European Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China 528300
中国·广东·佛山市顺德区大良街道办事处五沙社区居民委员会顺和南路1号欧洲工业园一号厂房首层、二层 邮编: 528300

t (86-757) 22805888 www.sgs.com.cn
t (86-757) 22805888 sgs.china@sgs.com



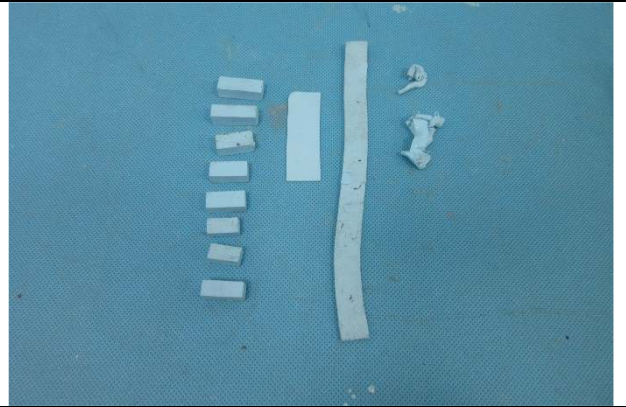
PCB 3 (No.6)



Wires (No.7~9)



Gery thermal conductive adhesive (No.10)



Blue thermal conductive adhesive (No.11)



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-CS Standards Technical Services (Shunde) Co., Ltd.
Shunde Branch / 佛山顺德分公司

1-2F, Building 1, European Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China 528300
中国·广东·佛山市顺德区大良街道办事处五沙社区居民委员会顺和南路1号欧洲工业园一号厂房首层、二层 邮编: 528300

t (86-757) 22805888 www.sgs.com.cn
t (86-757) 22805888 sgs.china@sgs.com

Part 2: Installation

The High-Performance Fanless System is designed for installation interior vehicles. Based on the closed design except for the connection Port, the inner grouping will be separated from the adjacent components of the vehicle. However, the connector cable should be connected with the external parts under normal use. It is impossible to know the details around the High-Performance Fanless System, within horizontal distance 20mm and vertical distance 200mm and then it is excluded in this report.

Part 3: Materials/components list

The evaluation is based on the combustible mass of materials. Therefore, all combustible materials (Non metallic materials) will be considered. Metallic materials and inorganics are not combustible and therefore they will not be taken into account.

According to the sample details and the specification of EN 45545-2, the following materials are relevant for evaluation:

| High-Performance Fanless System | | | | |
|---------------------------------|----------------------------------|-----------------|---------|--------------------------------------------------------------------------------------------|
| NO. | Description | Requirement | Results | Remark |
| 1 | Product shell (upper) | No requirements | A | 96/603/EC, A * |
| 2 | Product shell (below) | No requirements | A | 96/603/EC, A * |
| 3 | Product shell (side) | No requirements | A | 96/603/EC, A * |
| 4 | Other metal components | No requirements | A | 96/603/EC, A * |
| 5 | PCB 1** | R24/R25/R26 | R25 HL3 | SDFS2403001781FF, date: Mar 26,2024 |
| | PCB 2** | R24/R25/R26 | R25 HL3 | SDFS2403001780FF, date: Mar 26,2024 |
| 6 | PCB 3** | R24/R25/R26 | R25 HL3 | SDFS2403001782FF, date: Mar 26,2024 |
| 7 | Wire connectors | R26 | R26 HL3 | UL Card E304813, date: May. 22,2006 |
| 8 | Wire insulation layer | No requirements | / | EN 45545-2, Clause 4.3, Total combustible mass < 100g for grouped products, No requirement |
| 9 | Wire metal core | No requirements | A | 96/603/EC, A * |
| 10 | Gery thermal conductive adhesive | R24 | R24 HL3 | SDFS2403001778FF, date: Mar 26,2024 |
| 11 | Blue thermal conductive adhesive | R24 | R24 HL3 | SDFS2401000380FF, date: Mar 26,2024 |

* Based on the specification of 96/603/EC and Amending, 4 October 1996, establishing the list of products belonging to Classes A 'No contribution to fire' provided for in Decision 94/611/EC implementing Article 20 of



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

1-2/F, Building 1, European Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China 528300 t (86-757) 22805888 www.sgs.com.cn
 中国·广东·佛山市顺德区大良街道办事处五沙社区居民委员会顺和南路1号欧洲工业园一号厂房首层、二层 邮编: 528300 t (86-757) 22805888 sgs.china@sgs.com

Council Directive 89/106/EEC on construction products, the metal components are within the list of products belonging to Classes A.

** In respect of printed boards (EL9 according to EN 45545-2:2020+A1:2023, Table 2) it shall be noted that only the printed boards without any attached components have to meet the requirements. The attached technical equipment components will be accepted without any testing because of their functional necessity as stated in EN 45545-2:2020+A1:2023, clause 4.7.

IV. Test results in support of this assessment

| Name of the laboratory | Name of the sponsor | Test report Ref..No. | Test methods | Test results |
|------------------------|----------------------------------------|----------------------|--------------------|----------------------------------------------------------|
| SGS | VECOW CO., LTD. | SDFS2401000380FF | EN ISO 4589-2:2017 | OI: >60% Meet R24 HL1/HL2/HL3 |
| SGS | VECOW CO., LTD. | SDFS2403001778FF | EN ISO 4589-2:2017 | OI: >60% Meet R24 HL1/HL2/HL3 |
| SGS | VECOW CO., LTD. | SDFS2403001780FF | EN 60695-2-11:2014 | Glow Wire Temperature: 850°C; Meet R25 HL1/HL2/HL3 |
| SGS | VECOW CO., LTD. | SDFS2403001781FF | EN 60695-2-11:2014 | Glow Wire Temperature: 850°C; Meet R25 HL1/HL2/HL3 |
| SGS | VECOW CO., LTD. | SDFS2403001782FF | EN 60695-2-11:2014 | Glow Wire Temperature: 850°C; Meet R25 HL1/HL2/HL3 |
| UL | ZHANG CHUN CHEMICAL (ZHANGZHOU) CO LTD | UL Card No.E304813 | ANSI/IL94 | Flame Class: V0 Meet R26 HL1/HL2/HL3 |

V. Basis of this assessment

The basis for the evaluation of fire safety is the classification of vehicle types where the High-Performance Fanless System will be installed.

Following classifications are taken as basis:

EN 45545-2:2020+A1:2023 Railway applications—Fire protection on railway vehicles Part 2: Requirements for fire behaviour of materials and components, Hazard Level HL1, HL2 &HL3.



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

1/2F, Building 1, European Industrial Park, No.1, Shunde South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China 528300
中国·广东·佛山市顺德区大良街道办事处五沙社区居民委员会顺和南路1号欧洲工业园一号厂房首层、二层 邮编: 528300

t (86-757) 22805888 www.sgs.com.cn
t (86-757) 22805888 sgs.china@sgs.com

VI. Assessment according to EN 45545-2

Based on the requirements of EN 45545-2, the fire safety requirements for materials of electrical and electronic devices are defined in according to the installation location.

Considering the mass of combustible material of the High-Performance Fanless System, EN 45545-2 clause 4.2 n) “if listed products are used in an application below the mass and area thresholds given in 4.3, they may be treated as non-listed products” is applicable.

Therefore, the requirements of clause 4.3 “Grouping rules” will be assessed.

Key applicable grouping rules:

- No requirements apply to products with a combustible mass of < 10 g not in touching contact only with a product compliant to Table 2 and Table 3..
- If fully separated by a plate compliant with the fire integrity requirement of 5.3.7, then assign as different group.
- 4.3.2 Rule 1

If the total combustible mass of the grouped products is

- < 100 g for interior grouped products; or
- < 400 g for exterior grouped products;

no requirements apply to the products of this group.

This principle also applies to single products that meet the requirements of 4.3.1.

- 4.3.3 Rule 2

If the total combustible mass of the grouped products is

- < 500 g for interior grouped products; or
- < 2000 g for exterior grouped products;

one combustible product of this group has to be tested according to R24.

If this product is compliant to R24 it shall not be considered for further assessment of this group. The remaining products in this group shall be assessed starting with 4.3.1 again.

This principle also applies to single products that exceed the mass limits of Rule 1.

Clause 4.2 General,

m) if listed products are used in an application below the mass and area thresholds given in 4.3, they may be treated as non-listed products.



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

1-2/F, Building 1, European Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China 528300
 中国·广东·佛山市顺德区大良街道办事处五沙社区居民委员会顺和南路1号欧洲工业园一号厂房首层、二层 邮编: 528300

t (86-757) 22805888 www.sgs.com.cn
 t (86-757) 22805888 sgs.china@sgs.com

Assessment:

1. PCB1,PCB2,PCB3

As showed within the test report SDFS2403001780FF, SDFS2403001781FF& SDFS2403001782FF, the test results of samples are Glow Wire Temperature: 850°C, complies with the requirements of HL1, HL2 &HL3. defined in R25 of EN 45545-2:2020+A1:2023..

Technical equipment on the PCB

Based on the requirements of EN 45545-2 EL9, Printed circuit boards with all varnishes applied but without any attached technical equipment and no more specification for the attached technical equipment within EN 45545-2. The attached technical equipment components will be accepted without any testing because of their functional necessity as stated in EN 45545-2:2020, clause 4.7

2. Gery and blue thermal conductive adhesive

The mass of blue thermal conductive adhesive is 69.2g and grey thermal conductive adhesive is 44.3g, total combustible mass is113.5 g (less than 500g). Therefore, under the Clause 4.3.3 of EN 45545-2, should meet R24 of EN 45545-2:2020+A1:2023. As showed within the test report SDFS2403001778FF & SDFS2401000380FF, the test results of samples are OI>60%, complies with the requirements of HL1, HL2 &HL3 defined in R24 of EN 45545-2:2020+A1:2023.

3. Wires

The wires include non-metallic connectors, non-metallic insulating sheath and inner metal wire core. According to Table 2 Requirements of listed products of EN 45545-2, non-metallic connectors can be considered as EL10 and meet R26 of EN 45545-2:2020+A1:2023. As showed within the UL Card No. E304813, the Flame Class of the plastic material used in the non-metallic connectors is V0, complies with the requirements of HL1, HL2 &HL3 defined in R26 of EN 45545-2:2020+A1:2023.

The remained combustible mass of non-metallic insulating sheath is less than 100g for grouped products. Therefore, under the Clause 4.3.1 of EN 45545-2, exempt from the fire requirements defined in EN 45545-2:2020+A1:2023.



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

1-2/F, Building 1, European Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China 528300
 中国·广东·佛山市顺德区大良街道办事处五沙社区居民委员会顺和南路1号欧洲工业园一号厂房首层、二层 邮编: 528300

t (86-757) 22805888 www.sgs.com.cn
 t (86-757) 22805888 sgs.china@sgs.com

Assessment of the risks of a further fire development:

Because of its tight design and metal enclosure except the openings required for the final application, the ignition and fire occurring inside and outside the device are limited. Also, the quantity of the combustion materials is limited. Also, the quantity of the combustion materials is limited. A fire development and spreading from this product are thus also not conceivable.

Based on the test report and evaluation, it shows that the product does not have recognizable ignition and fire risks and evaluated as conform to the requirement of EN 45545-2, Clause 4.1 essential fire safety objectives.

VII. Conclusion

The fire protection documents and limitation are evaluated based on the standards EN 45545-1:2013 and EN 45545-2:2020+A1:2023.

The evaluation of all the presented descriptions, test report and documents show that the construction and material selection of the “High-Performance Fanless System” **comply with** the requirements HL3 of EN 45545-1:2013 and EN 45545-2:2020+A1:2023.

The evaluation is based on the verified demonstration documents.

VIII. Limitation

As for fire safety of evaluated product, there are no restrictions and conditions. They can be used in all the operation and construction class in the rail vehicles without restrictions.

If more accessories were used together with the High-Performance Fanless System, such as power source, data wire etc., should be re-evaluated based on the requirements of EN 45545-2 and installing conditions.

IX. Statements

The assess results relate only to the product in the form in which were assessed.

The purpose of the report is to provide a general overview of the evidence currently available and it should be read in conjunction with the specific reports detailed for each product where additional information is required.

Note: This document cannot be reproduced except full, without prior written approval of the Company.



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

1/2F, Building 1, European Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China 528300
 中国·广东·佛山市顺德区大良街道办事处五沙社区居民委员会顺和南路1号欧洲工业园一号厂房首层、二层 邮编: 528300

t (86-757) 22805888 www.sgs.com.cn
 t (86-757) 22805888 sgs.china@sgs.com

Photo Appendix:



SGS authenticate the photo on original report only

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-CS Standards Technical Services (China) Ltd.
Shunde Branch / 佛山顺德分公司

1-2/F, Building 1, European Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China 528300
中国·广东·佛山市顺德区大良街道办事处五沙社区居民委员会顺和南路1号欧洲工业园一号厂房首层、二层 邮编: 528300

t (86-757) 22805888 www.sgs.com.cn
t (86-757) 22805888 sgs.china@sgs.com