

TEST REPORT

No. : SZIN1803003831SC-01

Date : Aug 06, 2018

Page: 1 of 7

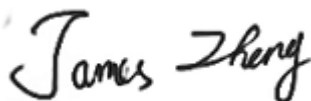
CUSTOMER NAME: DONGGUAN GUANG MAI ELECTRONIC TECHNOLOGY CO., LTD
ADDRESS: 16 B BUILDING, INTERNATIONAL FINANCE IT RESEARCH AND DEVELOPMENT CENTER, NO.5 KE JI TEN ROAD, SONGSHAN LAKE HIGH-TECH INDUSTRIAL DEVELOPMENT ZONE, DONGGUAN CITY, CHINA

General Description : A CELLULAR SILICONE FOAM
Trade Name : MICROESTM
Products Reference : GM-100/GM-200/GM-300/GM-400/GM-500/GM-600/GM-10/GM-20/GM-30/GM-40/GM-50/GM-60/JP-350
Thicknesses : 0.8,1.59,2.38,3.18,4.76,6.35,9.53,12.7
Material : POLYDIMETHYLSILOXANE FOAM
Manufacturer : DONGGUAN GUANGMAI ELECTRONIC TECHNOLOGY CO., LTD
Colour : GREY
Other Information : LIQUID CAST AND CURING OF FOAM

Above information and sample(s) was/were submitted and confirmed by the client. SGS, however, assumes no responsibility to verify the accuracy, adequacy and completeness of the sample information provided by client.

SGS Ref. No. : AJFS1804002800FF
Date of Receipt : Mar 29, 2018
Testing Start Date : Mar 29, 2018
Testing End Date : May 17, 2018
Test result(s) : For further details, please refer to the following page(s)
(Unless otherwise stated the results shown in this test report refer only to the sample(s) tested)

Signed for
SGS-CSTC Standards Technical
Services Co., Ltd. Shenzhen Branch
Testing Center



James Zheng
Authorized signatory



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch Testing Center- Materials Laboratory

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TEST REPORT

No. : SZIN1803003831SC-01

Date : Aug 06, 2018

Page: 2 of 7

Test Requested:

EN 45545-2:2013+A1:2015 Railway applications—Fire protection on railway vehicles Part 2: Requirements for fire behaviour of materials and components, and testing according to Table 5 — Material requirement sets (R22) (R23)

I. Description of Test specimens

Sample Description	Grey Foam
Color	Gray
Exposed (test) surface	One surface
Size of specimens	T01 EN ISO 4589-2: 150mm 10mm 10mm
	T10.03 EN ISO 5659-2: 75mm 75mm 5mm
	T12 NF X70-100-1&-2: 1, 1.0010g 2, 1.0015g 3, 0.9987g

II. Summary of test results

Requirement set (used for)	Test method reference	Parameter Unit	Test results *
R22 (IN16; EL2; EL6A; EL7A; M2)	T01 EN ISO 4589-2: OI	Oxygen content %	32.6
	T10.03 EN ISO 5659-2: 25 kW/m ²	Ds max. dimensionless	51.6
	T12 NF X 70-100-1 and -2 600°C	CIT _{NLP} dimensionless	0.03
R23 (EX12; EL2; EL5 EL6B; EL7B; M3)	T01 EN ISO 4589-2: OI	Oxygen content %	32.6
	T10.03 EN ISO 5659-2: 25 kW/m ²	Ds max. dimensionless	51.6
	T12 NF X 70-100-1 and -2 600°C	CIT _{NLP} dimensionless	0.03

* For the test details, please see the appendix of this test report.



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TEST REPORT

No. : SZIN1803003831SC-01

Date : Aug 06, 2018

Page: 3 of 7

III. Conclusion

According to the test results, the submitted sample **meets** the requirements of **R22 & R23** (detailed in Table 5 of EN 45545-2:2013+A1:2015) for a **HL3** Hazard Level Classification.

Test Criteria for EN 45545-2:2013+A1:2015 Table 5 Material requirement sets (R22) (R23)

Requirement set (used for)	Test method reference	Parameter Unit	Requirement Definition	HL1	HL2	HL3
R22 (IN16; EL2; EL6A; EL7A; M2)	T01 EN ISO 4589-2: OI	Oxygen content %	Minimum	28	28	32
	T10.03 EN ISO 5659-2: 25 kW/m ²	Ds max. dimensionless	Maximum	600	300	150
	T12 NF X 70-100-1 and -2 600°C	CIT _{NLP} dimensionless	Maximum	1.2	0.9	0.75
R23 (EX12; EL2; EL5 EL6B; EL7B; M3)	T01 EN ISO 4589-2: OI	Oxygen content %	Minimum	28	28	32
	T10.03 EN ISO 5659-2: 25 kW/m ²	Ds max. dimensionless	Maximum	--	600	300
	T12 NF X 70-100-1 and -2 600°C	CIT _{NLP} dimensionless	Maximum	--	1.8	1.5

Statements:

The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

The test results relate only to the specimens of the product in the form in which were tested.

The specimen was supplied by the sponsor and SGS-CSTC ANJI Branch was not involved in any selection or sampling procedure.



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TEST REPORT

No. : SZIN1803003831SC-01

Date : Aug 06, 2018

Page: 4 of 7

APPENDIX 1: T01 EN ISO 4589-2:2017 Determination of burning behaviour by oxygen Index

Part 2: Ambient temperature test

1. Conditioning

T: 23±2°C, R.H: 50±5%, at least 88 h.

2. Test results

- a) Select initial oxygen concentration (in accordance with 8.1.3): 28%
- b) Determining the Preliminary Oxygen Concentration (Till pair of oxygen concentrations which gives opposite response differs by ≤1%, in accordance with 8.5)

Oxygen concentration, % (V/V)	28	30	32	33				
Length burnt, mm	<50	<50	<50	>50				
Response, ("X" or "O")	O	O	O	X				

Oxygen concentration of the "O" response for the pair = 32.0% (this is the concentration to be used again for the first measurement in section below)

- c) Determination of the oxygen index (in accordance with 8.6)

Step size to be used for successive changes d in oxygen concentration = 0.2% [Initially to be 0.2% (V/V), unless otherwise instructed]

Parameter	N _T series measurements										
	NL series measurements (8.6.1 and 8.6.2)					(According to the 8.6.3)					
Oxygen concentration, % (V/V)	32.0	32.2	32.4	32.6		--	32.6	32.4	32.6	32.8	32.6
Length burnt, mm	<50	<50	<50	>50		--	>50	<50	<50	>50	>50
Response ("X" or "O")	O	O	O	X		→	X	O	O	X	X
	Column (2, 3, 4 or 5): 4						Row (1 to 16): 4				
	k value from EN ISO 4589-2 table 4: -0.14										
	Hence k= -0.14										

$$\begin{aligned}
 OI &= Cf + kd = 32.6 + (-0.14 \times 0.2) \\
 &= \underline{32.6\%} \text{ (to one decimal place)} \\
 &= \underline{32.57\%} \text{ (to two decimal places)}
 \end{aligned}$$



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TEST REPORT

No. : SZIN1803003831SC-01

Date : Aug 06, 2018

Page: 5 of 7

To be continued...

APPENDIX 2: T10.03 EN ISO 5659-2:2012 Plastics—Smoke generation — Part 2: Determination of optical density by a single- chamber test. Heat flux 25Kw/m² with pilot flame, test duration is 10min.

1. Conditioning

T: 23±2 °C, R.H: 50±5%, until the test sample was conditioned to constant mass.

2. Test Results

Parameters	1	2	3	Avg
D _s (1.5)	24.1	20.9	25.2	23.4
D _s (4)	42.3	40.6	43.4	42.1
D _s (10)	52.0	48.3	54.5	51.6
VOF ₄ min	110.1	99.2	117.6	109.0
D _s max	52.0	48.3	54.5	51.6
T (D _s max) s	599	599	598	599

NOTE:

D_s (n) is the specific optical density at nth min;

VOF₄ is the cumulative value of specific optical densities in the first 4 min of the test;

D_s max is the maximum optical density in the test chamber.



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TEST REPORT

No. : SZIN1803003831SC-01

Date : Aug 06, 2018

Page: 6 of 7

APPENDIX 3: T12 NF X70-100-1:2006 Fire tests—Analysis of gaseous effluents—Part 1: Methods for analysing gases stemming from thermal degradation & NF X70-100-2:2006 Fire tests—Analysis of gaseous effluents—Part 2: Tubular furnace thermal degradation method. Furnace Temperature: 600°C, Toxic for non-listed products.

1. Conditioning

T: 23±2°C and R.H 50±5%, at least 48h and until the test sample was conditioned to constant mass.

2. Test results

Gas component [mg/g]	1	2	3	Avg	Reference concentration [mg/m ³]
CO	28.14	26.59	25.48	26.74	1380
CO ₂	536.25	578.04	543.21	552.50	72000
HF	ND	ND	ND	--	25
HCl	ND	ND	ND	--	75
HBr	ND	ND	ND	--	99
HCN	ND	ND	ND	--	55
NO, NO _x	ND	ND	ND	--	38
SO ₂	ND	ND	ND	--	262

ND indicates Non-detected.

Calculations of CIT_{NLP}

$$CIT_{NLP} = 1 \frac{g}{m^3} \sum_{i=1}^{i=8} \frac{Y_i}{C_i}$$

Y_i : is the yield of ith gas in mg/g in the NF X70-100-1 tube furnace;

C_i : is the reference concentration of the ith gas in mg/m³.

CIT_{NLP} = 0.03



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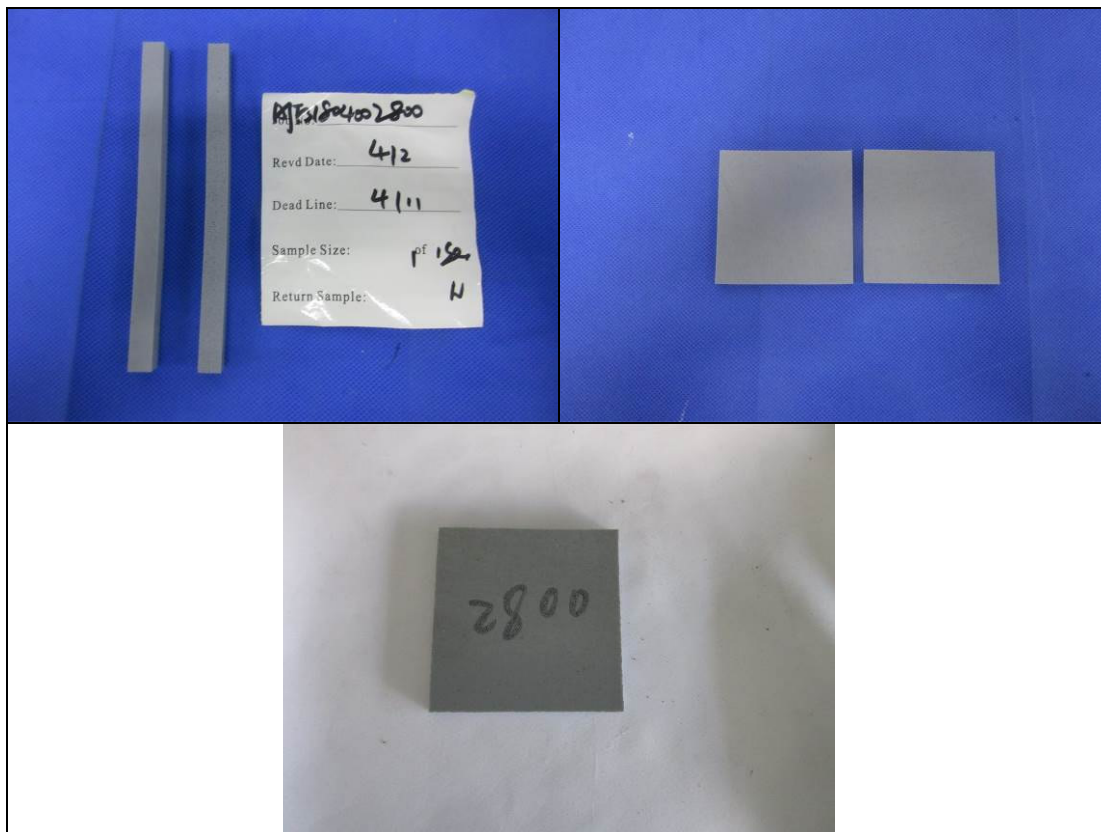
TEST REPORT

No. : SZIN1803003831SC-01

Date : Aug 06, 2018

Page: 7 of 7

Photo Appendix:



Appendix information:

1. The above tests were carried out by SGS-CSTC Standards Technical Services Co., Ltd. AnJi Branch.
2. This report cancels and supersedes the report No. SZIN1803003831SC.

***** End of report*****



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