

Test Report

No. SDFS2112008418FF

Date: Dec.31, 2021

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XIAMEN MJ INDUSTRIAL TECH CO.,LTD

NO 62-3,LIAN HUA SHE,LIAN HUA COMMUNITY,DONGFU STREET,HAICANG DIST,XIAMEN,FUJIAN,
CHINA 361027

Sample Description: PET EXPANDABLE BRAIDED SLEEVE

Manufacturer: XIAMEN MJ INDUSTRIAL TECH CO.,LTD

Material: POLYESTER, SIZE FROM 3MM TO 76MM

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.: XMHL2112007712OT

Sample Receiving Date: Dec.21, 2021

Test Performing Date: Dec.21, 2021 to Dec.31, 2021

Test Requested:

EN 45545-2:2020 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)

Test Results: -- See attached sheet --

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

scan to see the report



SDFS2112008418FF

Ada Liu
Approved signatory



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I. Description of Test specimens

Sample description	Net
Thickness	0.8 mm
Exposed (test) surface	One surface
Size of specimens	T01 EN ISO 4589-2: 140mm × 52mm × 0.8mm Type: V
	T10.03 & T11.02 EN ISO 5659-2: 75mm × 75mm × 0.8mm

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 %	39.1
	T10.03 EN ISO 5659-2: 25 kW/m ²	Ds max. dimensionless	0.00
	T11.02 EN 17084 Method 1 25 kW/m ²	CIT _G Dimensionless	0.006
R23 (EX12; EL2; EL5 EL6B; EL7B; M3)	T01 EN ISO 4589-2: OI	Oxygen content %	39.1
	T10.03 EN ISO 5659-2: 25 kW/m ²	Ds max. dimensionless	0.00
	T11.02 EN 17084 Method 1 25 kW/m ²	CIT _G Dimensionless	0.006

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

III. Conclusion

According to the test results, the submitted sample **meets** the requirements of **R22/R23** (detailed in Table 5 of EN 45545-2:2020) for a **HL1, HL2, HL3** Hazard Level Classification.



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Test Criteria for EN 45545-2:2020 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 EN 17084 Method 2 600 °C or T11.02 EN 17084 Method 1 25 kW/m ²	CIT _{NLP} Dimensionless Or CIT _G 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 EN 17084 Method 2 600 °C or T11.02 EN 17084 Method 1 25 kW/m ²	CIT _{NLP} Dimensionless Or CIT _G 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 SHUNDE Branch was not involved in any selection or sampling procedure.



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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): 25.0%
- 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)	25.0	35.0	39.0	40.0				
Length burnt (mm)	<80	<80	<80	>80				
Response, ("X" or "O")	O	O	O	X				

Oxygen concentration of the "O" response for the pair = 39.0 % (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)				cf
Oxygen concentration, % (V/V)	39.0	39.2				39.2	39.0	39.2	39.4	39.2
Length burnt (mm)	<80	>80				>80	<80	<80	>80	>80
Response ("X" or "O")	O	X				X	O	O	X	X
	k = -0.17									

$$\begin{aligned}
 OI &= Cf + kd = 39.2 + (-0.17 \times 0.2) \\
 &= \underline{39.17} \% \text{ (to two decimal places)} \\
 &= \underline{39.1} \% \text{ (to one decimal place)}
 \end{aligned}$$

Standard deviation $\hat{\sigma}$: 0.150

Burning behavior: Melt



APPENDIX 2: T10.03 EN ISO 5659-2:2017 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
Mass(g)	2.2	2.3	2.2	2.2
D _s (1.5)	0.00	0.00	0.00	0.00
D _s (4)	0.00	0.00	0.00	0.00
D _s (10)	0.00	0.00	0.00	0.00
VOF4	0.00	0.00	0.00	0.00
D _{s max}	0.00	0.00	0.00	0.00
T(D _{s max}) s	600	600	600	---
D _c	0.00	0.00	0.00	---

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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APPENDIX 3: T11.02 EN 17084:2018 Method 1 Gas analysis in the smoke chamber EN ISO 5659-2, using FTIR technique. Heat flux 25 kW/m² with pilot flame, test duration is 10min.

1. Conditioning

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

Measurement	Specimen 1	Specimen 2	Specimen 3	Average Value
Mass(g)	2.2	2.3	2.2	2.2

2. Test results

1) 4 min after the test start

Gas	1	2	3	Avg
Carbon Dioxide (CO ₂)	2847	3291	2861	3000
Carbon Monoxide (CO)	ND	ND	ND	---
Hydrogen Fluoride (HF)	ND	ND	ND	---
Hydrogen Chloride (HCl)	ND	ND	ND	---
Hydrogen Bromide (HBr)	ND	ND	ND	---
Hydrogen Cyanide (HCN)	ND	ND	ND	---
Nitrogen Oxides (NO _x)	ND	ND	ND	---
Sulphur Dioxide (SO ₂)	ND	ND	ND	---

2) 8 min after the test start

Gas	1	2	3	Avg
Carbon Dioxide (CO ₂)	5083	5681	5176	5313
Carbon Monoxide (CO)	8	8	8	8
Hydrogen Fluoride (HF)	ND	ND	ND	---
Hydrogen Chloride (HCl)	ND	ND	ND	---
Hydrogen Bromide (HBr)	ND	ND	ND	---
Hydrogen Cyanide (HCN)	ND	ND	ND	---
Nitrogen Oxides (NO _x)	ND	ND	ND	---
Sulphur Dioxide (SO ₂)	ND	ND	ND	---

Where, ND indicates Non-detected.

Note: All values given are in mg/m³.



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3) Calculation of CIT_G

Gas component	Reference concentration; mg/m ³
Carbon Dioxide (CO ₂)	72 000
Carbon Monoxide (CO)	1 380
Hydrogen Fluoride (HF)	25
Hydrogen Chloride (HCl)	75
Hydrogen Bromide (HBr)	99
Hydrogen Cyanide (HCN)	55
Nitrogen Oxides (NO _x)	38
Sulphur Dioxide (SO ₂)	262

$$CIT_G = 0.0805 \cdot \sum_{i=1}^{i=8} \frac{c_i}{C_i}$$

Where,

CIT_G – Conventional Index of Toxicity;

c_i – Concentration of the i^{th} gas;

C_i – Reference concentration of the i^{th} gas.

PARAMETER	1	2	3	Avg
CIT_G (4 min)	0.003	0.004	0.003	0.003
CIT_G (8 min)	0.006	0.007	0.006	0.006

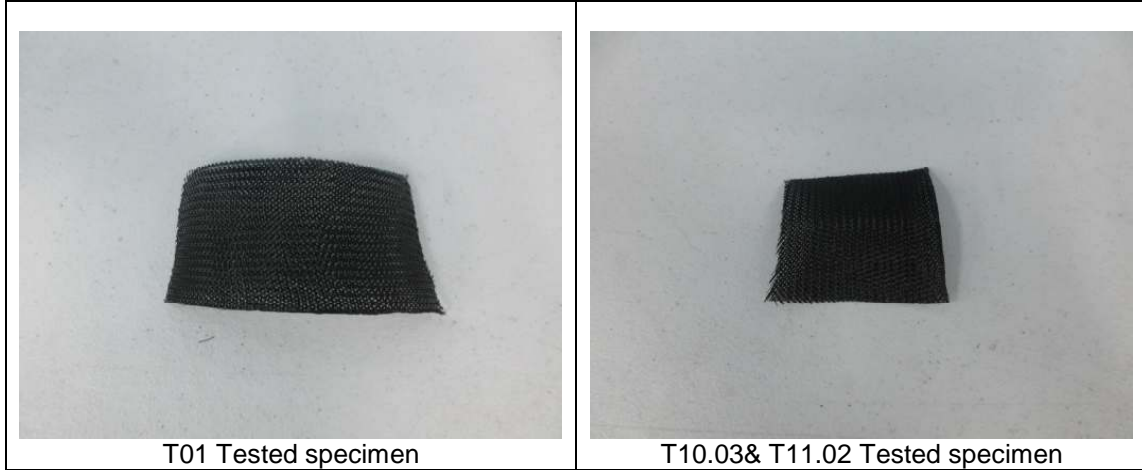


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Photo Appendix:



T01 Tested specimen

T10.03& T11.02 Tested specimen

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End of Report



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