中国认可
国际互认
检测
TESTING
CNAS L6069

Test Report

Report No. TC.22.04.001966

Date of Issue 05/12/2022

Applicant: **Caledonian Cables Limited**

Applicant address: **1/F., CMA Building, 64-66 Connaught Road Central, Hong Kong**

Description of the test subject:

Sample	Description	Photo
001	Sample Description: Fiber Optical Cable MLA-OM1-16-HSWAH, 16C OM1 Fiber/Jelly Filled Loose Tube/CSM/WBT/LSZH/SWA/LSZH Style No.: Fiber Optical Cable MLA-OM1-16-HSWAH Manufacturer: Caledonian Cables Limited	

Receipt Date of Sample: **04/28/2022**

Date of Testing: **From 04/28/2022 to 05/09/2022**

Sample Submitted: **The sample(s) was (were) submitted by applicant and identified.**

Conclusion:

Test Items			Conclusion
No.	Items	Standard	
1	Test for vertical flame spread of vertically-mounted bunched wires or cables - Category C	IEC 60332-3-24:2018	Pass
2	Single wire or cable burn testing	IEC 60332-1-2:2015	Pass
3	Halogen acid gas content	EN 60754-1:2014 (IEC 60754-1:2011+AMD1:2019*)	Pass
4	pH and conductivity	IEC 60754-2:2011 +AMD1:2019	Pass
5	Smoke density testing	IEC 61034-2:2005+ AMD1:2013+AMD2:2019	Pass

Remark: *The test item is not included in CNAS Accredited Scope.

Laboratory:
TÜV SÜD SW Rail Transportation Technology (Jiangsu) Co., Ltd.

Phone: +86/ (0) 519- 8123-9872
Fax: +86/ (0) 519- 8123-9872 ext.123
E-mail: Haixin.Zhao@tuvsud.com
www.tuvsud.com

Regd. Office:
Innovative Industry Park, No. 377 Wuyinan Road, National High and New Technology & Industry Development Zone, Wujin, 213015 P.R. China

Test Report

Report No. TC.22.04.001966

Date of Issue 05/12/2022

Test Results

1. IEC 60332-3-24:2018 Tests on electric and optical fibre cables under fire conditions - Part 3-24: test for vertical flame spread of vertically-mounted bunched wires or cables - Category C

1.1 Sample details

Length of test sample(m)	3.5
Cable diameter (mm)	13.5
Non-metallic volume per metre of test sample(L)	1.5
Number of cores	5
Range of conductor cross-sections (mm^2)	≤35
Number of strands in the bundle	1
Number of bundles	13
Number of layers	1
Number of burners	1
Positioning of test pieces	Touching
Flame application time(min)	20

Precondition	Temperature (℃)	Humidity (%)	Duration (h)
	20±10	50±20	≥16

1.2 Test results

Measurements/ observation	Result
The extent of damage(m)	0.72

Recommended performance requirement:
The maximum extent of the charred portion measured on the sample shall not have reached a height exceeding 2.5m above the bottom edge of the burner.

Conclusion: Pass

Laboratory:
TÜV SÜD SW Rail Transportation Technology (Jiangsu) Co., Ltd.

Phone: +86/ (0) 519- 8123-9872
Fax: +86/ (0) 519- 8123-9872 ext.123
E-mail: Haixin.Zhao@tuvsud.com
www.tuvsud.com

Regd. Office:
Innovative Industry Park, No. 377 Wuyinan Road, National High and New Technology & Industry Development Zone, Wujin, 213015 P.R. China

Test Report

Report No. TC.22.04.001966

Date of Issue 05/12/2022

2. IEC 60332-1-2:2015 Tests on electric and optical fibre cables under fire conditions —Part 1-2: Test for vertical flame propagation for a single insulated wire or cable —Procedure for 1 kW pre-mixed flame

2.1 Sample details

Length of test sample	600 mm
Cable diameter	13.8 mm
Core	5

	Temperature (℃)	Humidity (%)	Duration (h)
Precondition	23±5	50±20	≥16

2.2 Test results

Measurements/ observation	1st Test
The distance between the lower edge of the top support and the onset of charring (mm)	455
The distance between the lower edge of the top support and the charring downwards (mm)	515

Note: If a failure is recorded, two more tests shall be carried out. If both tests result in passes, the single insulated conductor or cable shall be deemed to have passed the test.

Requirement:
1) The single insulated conductor or cable shall pass the test if the distance between the lower edge of the top support and the onset of charring is greater than 50 mm.
2) In addition, a failure shall be recorded if charring extends downwards to a point greater than 540 mm from the lower edge of the top support.

Conclusion: Pass

Laboratory:
TÜV SÜD SW Rail Transportation Technology (Jiangsu) Co., Ltd.

Phone: +86/ (0) 519- 8123-9872
Fax: +86/ (0) 519- 8123-9872 ext.123
E-mail: Haixin.Zhao@tuvsud.com
www.tuvsud.com

Regd. Office:
Innovative Industry Park, No. 377 Wuyinan Road,
National High and New Technology & Industry
Development Zone, Wujin, 213015 P.R. China

Test Report

Report No. TC.22.04.001966

Date of Issue 05/12/2022

3. EN 60754-1:2014 (IEC 60754-1:2011+AMD1:2019*) Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content

3.1 Sample details

Weight	S1: 1.0003 g; S2: 1.0005 g

Precondition	Temperature (℃)	Humidity (%)	Duration (h)
	23±2	50±5	≥16

Test apparatus	Method 2: Use of laboratory compressed air supply
Temperature of thermocouple	800 °C
Test time	20 min

3.2 Test result

Gas (mg/g)	1	2	Average
HCl	5	5	5

Remark:1) Record = 5 when the amount of halogen acid is less than 5 mg/g.
2) Halogen acids evolved, except hydrofluoric acid, was expressed as hydrochloric acid (HCl).

Client's requirement: ≤0.5%

Conclusion: Pass

Laboratory:
TÜV SÜD SW Rail Transportation Technology (Jiangsu) Co., Ltd.

Phone: +86/ (0) 519- 8123-9872
Fax: +86/ (0) 519- 8123-9872 ext.123
E-mail: Haixin.Zhao@tuvsud.com
www.tuvsud.com

Regd. Office:
Innovative Industry Park, No. 377 Wuyinan Road,
National High and New Technology & Industry
Development Zone, Wujin, 213015 P.R. China

Test Report

Report No. TC.22.04.001966

Date of Issue 05/12/2022

4. IEC 60754-2:2011+AMD1:2019 Test on gases evolved during combustion of materials from cables— part 2: Determination of acidity (by PH measurement) and conductivity

4.1 Sample details

Weight	S1: 1.0003 g; S2: 1.0012 g; S3: 1.0015 g

Precondition	Temperature (℃)	Humidity (%)	Duration (h)
	23±2	50±5	≥16

4.2 Test result

	Result			Average
pH	4.68	4.79	4.51	4.66
Conductivity(μs/mm)	0.41	0.35	0.31	0.36

Requirement: pH ≥ 4.3, Conductivity ≤10 μs/mm

Conclusion: Pass

Laboratory:
TÜV SÜD SW Rail Transportation Technology (Jiangsu) Co., Ltd.

Phone: +86/ (0) 519- 8123-9872
Fax: +86/ (0) 519- 8123-9872 ext.123
E-mail: Haixin.Zhao@tuvsud.com
www.tuvsud.com

Regd. Office:
Innovative Industry Park, No. 377 Wuyinan Road,
National High and New Technology & Industry
Development Zone, Wujin, 213015 P.R. China

Test Report

Report No. TC.22.04.001966

Date of Issue 05/12/2022

5. IEC 61034-2:2005+AMD1:2013+AMD2:2019 Measurement of smoke density of cables burning under defined conditions Part 2: Test procedure and requirements

5.1 Sample details

Diameter	13.5 mm
Number of cores	5
Number of bundles	3
Number of strands in the bundle	1

Precondition	Temperature (℃)	Duration (h)
	23±5	≥16

5.2 Test result

The minimum light transmittance within 40 minutes; (%)	94.54

Requirement: Within the first 40 minutes, the light transmittance shall not drop to below 60%.

Conclusion: Pass

Laboratory:
TÜV SÜD SW Rail Transportation Technology (Jiangsu) Co., Ltd.

Phone: +86/ (0) 519- 8123-9872
Fax: +86/ (0) 519- 8123-9872 ext.123
E-mail: Haixin.Zhao@tuvsud.com
www.tuvsud.com

Regd. Office:
Innovative Industry Park, No. 377 Wuyinan Road,
National High and New Technology & Industry
Development Zone, Wujin, 213015 P.R. China

中国认可
国际互认
检测
TESTING
CNAS L6069

Test Report

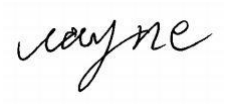
Report No. TC.22.04.001966

Date of Issue 05/12/2022

Statement：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 the sole criterion for assessing the potential smoke and toxicity hazard of the product in use. Test results are just for internal reference.

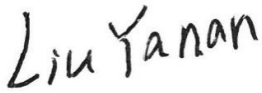
TÜV SÜD SW Rail Transportation Technology (Jiangsu) Co., Ltd.

Drafted by:



Wayne Wang

Approved by:



Yanan Liu

-End of Report-

Laboratory:
TÜV SÜD SW Rail Transportation Technology (Jiangsu) Co., Ltd.

Phone: +86/ (0) 519- 8123-9872
Fax: +86/ (0) 519- 8123-9872 ext.123
E-mail: Haixin.Zhao@tuvsud.com
www.tuvsud.com

Regd. Office:
Innovative Industry Park, No. 377 Wuyinan Road,
National High and New Technology & Industry
Development Zone, Wujin, 213015 P.R. China