

Report No. TC.19.07.004941

Date of Issue 07/26/2019

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	<p>Sample Description: Fire Resistant Electric Cables</p> <p>Style No: RE-2X(C)H...CI</p> <p>Ratings: 1P×0.5mm²</p> <p>Brand name: CALEDONIAN</p>	

Receipt Date of Sample: 07/17/2019

Date of Testing: From 07/17/2019 to 07/26/2019

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

Conclusion:

Test Items			Conclusion
No.	Items	Standard	
1	Vertically-mounted bunched wires or cables burn testing	IEC 60332-3-24:2018	Pass
2	Smoke density testing	IEC 61034-2:2013	Pass
3	Determination of the halogen acid gas content	IEC 60754-1:2011	See test result
4	Determination of acidity (by PH measurement) and conductivity	IEC 60754-2:2011	Pass
5	Tests for electric cables under fire conditions - Circuit integrity	IEC 60331-2:2018	Pass

Note: (1) General Terms & Conditions as mentioned overleaf,(2)The results relate only to the items tested,(3)The test report shall not be reproduced except in full without the written approval of the company. (4) Samples are tested as received.

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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 (Edition 2.0)

1.1 Sample details

Specimen size(m)	3.5
Cable diameter (mm)	10.5
Conductor diameter (mm)	1.32
Non-metallic volume per meter of test sample(L)	1.5
Range of conductor cross-sections (mm ²)	≤35
Number of layers	6
Number of burners	1
Flame application time (min)	20

Precondition	Temperature (°C)	Humidity (%)	Duration(h)
	20±10	50±20	16

1.2 Test results

Measurements/ observation	Result
The extent of damage	0.4m

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

2. IEC 61034-2:2013 Measurement of smoke density of cables burning under defined conditions Part 2: Test procedure and requirements

2.1 Sample details

Diameter	10.5mm
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Pre-conditioning	Indoor		Duration
	Temp: 23±2°C	Humidity: 50±5%	16 h

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Ignition Source	Fire source 1
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2.2 Test Result

The minimum light transmittance within 40 minutes; (%)	94.21
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Requirement: Within the first 40 minutes, the light transmittance shall not drop to below 60%.

Conclusion: Pass

3. IEC 60754-1:2011 Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content

3.1 Sample details

Weight	Sheath: S1: <u>1.0004</u> g; S2: <u>1.0021</u> g Insulation: S1: <u>1.0011</u> g; S2: <u>1.0014</u> g
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Precondition	Temperature (°C)	Humidity (%)	Duration(h)
	23±2	50±5	16

3.2 Test Result

Sheath	Gas (mg/g)	1	2	Average
	HCl	ND	ND	ND

Insulation	Gas (mg/g)	1	2	Average
	HCl	ND	ND	ND

Remark: 1) Halogen acids evolved, except hydrofluoric acid, was expressed as hydrochloric acid(HCl).
2)ND-Not Detected

4. IEC 60754-2:2011 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	Sheath: S1: <u>1.0021</u> g; S2: <u>1.0009</u> g Insulation: S1: <u>1.0029</u> g; S2: <u>1.0033</u> g
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Precondition	Temperature (°C)	Humidity (%)	Duration(h)
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	23±2	50±5	16
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4.2 Test Result

Test Item(Sheath)	Result		Average
PH	4.56	4.59	4.58
Conductivity(μs/mm)	0.70	0.72	0.71

Test Item(Insulation)	Result		Average
PH	5.43	5.39	5.41
Conductivity(μs/mm)	0.18	0.18	0.18

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

Conclusion: Pass

5. IEC 60331-2:2018 Tests for electric cables under fire conditions - Circuit integrity - Part 2: Test method for fire with shock at a temperature of at least 830°C for cables of rated voltage up to and including 0,6/1,0 kV and with an overall diameter not exceeding 20mm (Edition 2.0)

5.1 Sample details:

Diameter	10.5mm
Sample size	1200 mm
Min. bending radius	6D
Test duration	120min
Voltage	500V
Shock application	The shock-producing device impacts the wall after 5min±10s from activation and subsequently at 5min±10s intervals
Atmosphere condition	10°C-40°C

Cable type	Electric power and control cables with rated voltage up to and including 600/1000V
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5.2 Test results:

Records	1
Fuse failure or interruption of the circuit breaker(Yes/No)	No

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Phone: +86/ (0) 519-8123-9872
 Fax: +86/ (0) 519-8123-9872 ext.123
 E-mail: hui.shen@tuv-sud.cn
www.tuv-sud.cn

No. 164, Wuyi Road ,Lucheng Street, Wujin District, Changzhou city, Jiangsu Province, 213015 P.R. China



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The lamp extinguishing(Yes/No)	No
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Point of failure:

The criteria for determining the point of failure shall be as follows:

- 1) The voltage is not maintained during the test duration, as indicated by fuse failure or by interruption of the circuit breaker.
- 2) A conductor ruptures during the test duration, as indicated by the lamp extinguishing.

Evaluation: Pass

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.

Changzhou Jinbiao Railway Transportation Technical Service Co., Ltd.

Drafted by:

Lynn liu

Approved by:

Shen hui

-End of Report-

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