

**Report No.** TC.19.10.006870

**Date of Issue** 11/15/2019

**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.: FFX400 1mZZ1-R (NHXH FE180/E90)</p> <p>Size: 2×1.5mm<sup>2</sup></p> <p>Brand name: CALEDONIAN</p>	

**Receipt Date of Sample:** 10/22/2019

**Date of Testing:** From 10/22/2019 to 11/15/2019

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

**Conclusion:**

Test Items			Conclusion
No.	Items	Standard	
1	Determination of the halogen acid gas content	IEC 60754-1:2011	See test results
2	Determination of acidity (by PH measurement) and conductivity	IEC 60754-2:2011	Pass
3	Smoke density testing	IEC 61034-2:2013	Pass
4	Circuit integrity under fire conditions	BS 6387:2013	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 60754-1:2011 Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content**

**1.1 Sample details**

Weight	Sheath: S1: 1.0021 g; S2: 1.0069 g
	Insulation: S1: 1.0021 g; S2: 1.0034 g

Precondition	Temperature (°C)	Humidity (%)	Duration(h)
	23±2	50±5	16

**1.2 Test Result**

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

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

**2. IEC 60754-2:2011 Test on gases evolved during combustion of materials from cables – part 2: Determination of acidity (by PH measurement) and conductivity**

**2.1 Sample details**

Weight	Sheath: S1: 1.0020 g; S2: 1.0031 g; S3: 1.0003 g
	Insulation: S1: 1.0046 g; S2: 1.0038 g; S3: 1.0009 g

Precondition	Temperature (°C)	Humidity (%)	Duration(h)
	23±2	50±5	16

**2.2 Test Result**

Sheath	Result			Average
PH	5.43	5.69	5.51	5.54
Conductivity(µs/mm)	1.84	1.81	1.79	1.81

Insulation	Result			Average
PH	5.97	6.03	5.69	5.90

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Conductivity( $\mu\text{s}/\text{mm}$ )	2.29	2.14	2.20	2.21
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**Requirement:** PH  $\geq$  4.3, Conductivity  $\leq$  10  $\mu\text{s}/\text{mm}$

**Conclusion:** Pass

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

**3.1 Sample details**

Diameter	13.0mm
Number of bundles	3
Number of strands in the bundle	1

Pre-conditioning	Indoor		Duration
	Temp: 23 $\pm$ 2 $^{\circ}\text{C}$	Humidity: 50 $\pm$ 5%	16 h
Ignition Source	Fire source 1		

**3.2 Test Result**

The minimum light transmittance within 40 minutes; (%)	86.20
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**Requirement:** Within the first 40 minutes, the light transmittance shall not drop to below 60%.

**Conclusion:** Pass

**4. BS 6387:2013 Test method for resistance to fire of cables required to maintain circuit integrity under fire conditions**

No.	Test Item	Unit	Requirement	Evaluation
4	Resistance to fire of cables			
4.1	950 $\pm$ 40 $^{\circ}\text{C}$ Flame time: 180min, apply rated voltage 1kV			
	Whether the fuses rupture during the period of the test	--	None of the fuses ruptures during the period of the test	Pass
	Whether the lamp is extinguished during the period of the test	--	None of the lamp is extinguished during the period of the test	Pass

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4.2	650°C±40°C Flame apply for 15min+Water spray 15min, apply rated voltage 1kV			
	Whether the fuses rupture during the period of the test	--	None of the fuses ruptures during the period of the test	Pass
	Whether the lamp is extinguished during the period of the test	--	None of the lamp is extinguished during the period of the test	Pass
4.3	950°C±40°C Flame time: 120min Shock time: 5min intervals, bending radius is about 80mm, apply rated voltage 1kV			
	Whether the fuses rupture during the period of the test	--	None of the fuses ruptures during the period of the test	Pass
	Whether the lamp is extinguished during the period of the test	--	None of the lamp is extinguished during the period of the test	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 be the sole criterion for assessing the potential smoke and toxicity hazard of the product in use.

Test results are just for client internal reference.

Changzhou Jinbiao Railway Transportation Technical Service Co., Ltd.

Drafted by:

Lynn liu

Approved by:

Shen hui

-End of Report-

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