Report No. **TC.18.02.000754-R_4**

Date of Issue **05/21/2018**

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	Name: Fire Resistant Electric Cables Type designation: FFX400 1m RZ1-R Size :5×120mm^2	

Receipt Date of Sample: **02/23/2018**

Date of Testing: **From 02/23/2018 to 04/14/2018**

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

Conclusion:

Test Items			Result
No.	Items	Standard	
1	Method for assessment of fire integrity of large diameter power cables for use as components for smoke and heat control systems and certain other active fire safety systems	BS 8491: 2008	Pass
2	Test on gases evolved during combustion of materials from cables Part 1: Determination of the halogen acid gas content	IEC 60754-1:2011	Pass
3	Test on gases evolved during combustion of materials from cables Part 2: Determination of acidity (by PH measurement) and conductivity	IEC 60754-2:2011	Pass
4	Measurement of smoke density of cables burning under defined conditions. Part 2: Test procedure and requirements	IEC 61034-2:2005+A1:2013	Pass

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Test Results

1. BS 8491:2008 Method for assessment of fire integrity of large diameter power cables for use as components for smoke and heat control systems and certain other active fire safety systems.

1.1 Sample details

Specimen size	1.5m
Number of conductors	5
Voltage rating	1000V
Testing environment	T :10℃-40℃

1.2 Test results

No.	Test items	Requirements	Test result	Conclusion
1	Resistance to fire with water and mechanical shock 830℃±40℃ 30min	No blown fuse or circuit breaker disconnect (Ie no short circuit) No light bulb goes out (Ie no conductor blown)	No blown fuse or circuit breaker disconnect (Ie no short circuit) No light bulb goes out (Ie no conductor blown)	Pass
2	Resistance to fire with water and mechanical shock 830℃±40℃ 60min	No blown fuse or circuit breaker disconnect (Ie no short circuit) No light bulb goes out (Ie no conductor blown)	No blown fuse or circuit breaker disconnect (Ie no short circuit) No light bulb goes out (Ie no conductor blown)	Pass
3	Resistance to fire with water and mechanical shock 830℃±40℃ 120min	No blown fuse or circuit breaker disconnect (Ie no short circuit) No light bulb goes out (Ie no conductor blown)	No blown fuse or circuit breaker disconnect (Ie no short circuit) No light bulb goes out (Ie no conductor blown)	Pass

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

2.1 Sample details

Weight (Sheath)	Sample 1:1.01g Sample 2:1.02g Sample 3:1.01g
Weight (Insulation)	Sample 1:1.01g Sample 2:1.03g Sample 3:1.01g

Conditioning	Temperature (℃)	Humidity (%)	Duration (h)
	23±2	50±5	At least 48h

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2.2Test results

Sheath

Gas (mg)	1	2	3	Average	Content （%）	Acceptance Criteria （%）	Evaluation
Hydrogen Fluoride (HF)	0.27	0.26	0.26	0.26	0.03	≤0.1	Pass
Hydrogen Chloride (HCl)	0	0	0	0	0	≤0.5	Pass

Insulation

Gas (mg)	1	2	3	Average	Content （%）	Acceptance Criteria （%）	Evaluation
Hydrogen Fluoride (HF)	0.23	0.27	0.25	0.25	0.03	≤0.1	Pass
Hydrogen Chloride (HCl)	0	0	0	0	0	≤0.5	Pass

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

3.1 Sample details

Weight (Sheath)	Sample 1:1.01g Sample 2:1.02g Sample 3:1.01g
Weight (Insulation)	Sample 1:1.01g Sample 2:1.03g Sample 3:1.02g

Conditioning	Temperature (℃)	Humidity (%)	Duration (h)
	23±2	50±5	At least 48h

3.2 Test results

Sheath

Items	1	2	3	Average	Acceptance Criteria	Evaluation
PH	4.37	4.36	4.36	4.36	＞4.3	Pass
Electrical conductivity(μS/mm)	2.86	2.86	2.85	2.86	＜10	Pass

Insulation

Items	1	2	3	Average	Acceptance Criteria	Evaluation

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PH	4.43	4.42	4.43	4.43	＞4.3	Pass
Electrical conductivity(μS/mm)	1.79	1.78	1.77	1.78	＜10	Pass

4. IEC 61034-2:2005+A1:2013 Measurement of smoke density of cables burning under defined conditions. Part 2: Test procedure

4.1 Sample details

Diameter	60 mm

Pre-conditioning	Indoor		Min. 72 h
	Temp: 23±2℃	Humidity: 50±5%	16 h
Ignition Source	Fire source 1: Alcohol		

4.2 Test Result

The minimum light transmittance within the first 20 minutes; (%)	78.4
Conclusion	Pass

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

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: Approved by:

Lynn liu Shen hui

-End of Report

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