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BRE Global Test Report

Fire Testing of National Cables Industry 'New Approval of Single Core' Cables

Prepared for: National Cables Industry

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1 Introduction

The requirement of the work was to determine the performance of a cable when tested to BS 6387:2013 CWZ [1], EN 61034-2:2005 [2], IEC 60331-21:1999 [3] and EN 60754-1:2014 [4].

The work was undertaken on behalf of the LPCB, Schedule P106809-1000 V2.

This report is issue 2 of BRE report P106809-1001 Issue 1 dated 20 December 2017. LPCB required to carry out additional testing at a higher voltage 1000V on BS 6387 Category C & Z test was added to this report. BRE report P106809-1001 Issue 1 dated 20 December 2017 has been withdrawn with effect from the date of this report.

2 Cable Details

The 1×1.5mm^2 cable (BRE sample reference F1231) was a 3.98mm cable diameter which comprised the following components:

- Copper Conductor - Stranded
- Mica Tape
- Insulation – Green and Yellow

The 1×1.5mm^2 cable (BRE sample reference F1231) sheath had the following printed marking:

ELECTRIC CABLE 1×1.5mm^2 CU/LSZH-FP 450/750 V BS 8592 2017 NATIONAL CABLES INDUSTRY UAE

The 1×95mm^2 cable (BRE sample reference F1504) was a 16.42mm cable diameter which comprised the following components:

- Copper Conductor - Stranded
- Mica Tape
- Insulation – Green & Yellow

The 1×95mm^2 cable (BRE sample reference F1504) sheath had the following printed marking:

ELECTRIC CABLE, 1×95MM^2, CU/LSZH-FP, 450/750V, GEN. TO BS EN 50525-3-41 & IEC 60331, 2017, NATIONAL CABLES INDUSTRY, U.A.E.

The 1×400mm^2 cable (BRE sample reference F1503) was a 29.83mm cable diameter which comprised the following components:

- Copper Conductor - Stranded
- Mica Tape
- Insulation – Green & Yellow

The 1×400mm^2 cable (BRE sample reference F1503) sheath had the following printed marking:

ELECTRIC CABLE, 1×400MM^2, CU/LSZH-FP, 450/750V, GEN. TO BS EN 50525-3-41 & IEC 60331, 2017, NATIONAL CABLES INDUSTRY, U.A.E.

The test specimens were supplied by the client and received on the 5 March 2017 and 28 September 2017. BRE Global was not involved in the sample selection process and therefore cannot comment upon the relationship between samples supplied for test and the product supplied to market.

3 Test results

3.1 BS 6387:2013 – Fire resistance

3.1.1 BS 6387:2013 - Resistance to fire alone

Cable type	BRE sample reference	Test category	Test voltage (Uo/U)	Comment	**Result**
1×1.5mm^2	F1231	C	600/1000V	No fuses ruptured or lamps extinguished	**Pass***
1×95mm^2	F1504	C	600V	No fuses ruptured or lamps extinguished	**Pass****
1×400mm^2	F1503	C	600V	No fuses ruptured or lamps extinguished	**Pass****
1×400mm^2	F1503	C	1000V	No fuses ruptured or lamps extinguished	**Pass****

* 3 cables tested in a 20mm Stainless Steel conduit

** 1 cable tested in a 38mm Stainless Steel Conduit

3.1.2 BS 6387:2013 - Resistance to fire with water

Cable type	BRE sample reference	Test category	Test voltage (Uo/U)	Comment	**Result**
1×1.5mm^2	F1231	W	600/1000V	No fuses ruptured or lamps extinguished	**Pass***
1×95mm^2	F1504	W	600V	No fuses ruptured or lamps extinguished	**Pass****

* 3 cables tested in a 20mm Stainless Steel conduit

** 1 cable tested in a 20mm Stainless Steel conduit

3.1.3 BS 6387:2013 - Resistance to fire with mechanical shock

Cable type	BRE sample reference	Test category	Test voltage (Uo/U)	Comment	**Result**
1×1.5mm^2	F1231	Z	600/1000V	No fuses ruptured or lamps extinguished	**Pass***
1×95mm^2	F1504	Z	600V	No fuses ruptured or lamps extinguished	**Pass****
1×95mm^2	F1504	Z	1000V	No fuses ruptured or lamps extinguished	**Pass****

* 3 cables tested in a 20mm Stainless Steel conduit

** 1 cable tested in a 20mm Stainless Steel conduit

3.2 EN 61034-2:2005 - Smoke emission

Cable Type	BRE sample reference	Cable Diameter (mm)	No. of cable lengths	Minimum light transmission %	**Result**
1×1.5mm^2	F1231	3.98	3 bundles of 7 (21 cables)	84.29	**Pass**
1×95mm^2	F1504	16.42	3 cables	87.66	**Pass**
1×400mm^2	F1503	29.83	2 cables	85.26	**Pass**

3.3 IEC 60331-21:1999 - Fire resistance

Cable type	Burner Temperature	Test voltage (Uo/U)	Test Duration	Comment	**Result**
1×1.5mm^2 F1231	972.0°C	600V	90+15mins	No fuses ruptured or lamps extinguished	**Pass**
1×95mm^2 F1504	786.7°C	600V	90+15mins	No fuses ruptured or lamps extinguished	**Pass**
1×400mm^2 F1503	786.7°C	600V	90+15mins	No fuses ruptured or lamps extinguished	**Pass**

3.4 EN 60754-1:2014 - Acid gas emission

Cable	Component	%HCl per gram of sample
1×1.5mm^2 F1231	Insulation	<0.5%
	Mica Tape	

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4 References

1. BS 6387:2013. Test method for resistance to fire of cables required to maintain circuit integrity under fire conditions. British Standards Institution, London, 2013.
2. EN 61034-2:2005, 'Measurement of smoke density of cables burning under defined conditions – Part 2: – Test procedure and requirements', International Electrotechnical Commission, Geneva 2005.
3. IEC 60331-21:1999. Tests for electric cables under fire conditions - Circuit integrity - Part 21: Procedures and requirements - Cables of rated voltage up to and including 0,6/1,0 kV. International Electrotechnical Commission, Geneva, Switzerland, 1999.
4. EN 60754-1:2014, 'Test on gases evolved during combustion of material from cables. Part 1: Determination of the amount of halogen acid gases', International Electrotechnical Commission, Geneva, 2014.

Report Ends