

السادة / شركة Ecab

تحية طيبة وبعد...

الموضوع :- بشأن الطلب المقدم من سيادتكم بتاريخ 2025/5/20 بشأن إجراء فحص واختبار كابل إنذار حريق .

بالإشارة إلى الموضوع عالية. نتشرف بأن نرفق لسيادتكم التقرير الذي أعد بواسطة السيد الاستاذ الدكتور/ أحمد عبدالله حسام الدين شاهين - بقسم الهندسة الكهربائية وذلك من خلال المركز الهندسي .

مع خالص احترامي وتقديري،،

المدير التنفيذي للمركز الهندسي
كلية الهندسة – جامعة الاسكندرية


ا.د/ زياد محمد طارق الصياد



تحريرا فى :- 26 مايو 2025 .
شيماء .


26/05/2025

INVESTIGATION AND TESTING OF A NEW FIRE ALARM CABLE SAMPLE

Standards:

IEC61537 / BS-7671/BS EN 61537/BS EN 50525-2-31/ BS-6387/ /NFPA 72/IEC 60332 1-2/ /IEC 1857/06/IEC 1863/06/IEC 1855/06/IEC60068-2-75/IEC 60364-5-52/IEC 60502-2/ISO 1461/ISO 11801/ UL 1424/ANSI pertain to fire alarm system and The Egyptian Standard Specifications (ESS) 128

-Tests Performed at: High Voltage Laboratory. Department of Electrical Engineering, Faculty of Engineering, Alexandria University, Alexandria, Egypt.

-Samples Supplied by: Ecab FUTURE CABLE

- Country of Origin: Egypt

- Manufacturers: Ecab FUTURE CABLE

- Number of samples supplied: Two

- Nominal Voltage: 450/ 750 V a-c

- Maximum Temperature for System Components (storage, Installation and Applications):105°C (according to manufacturer).

- Frequency: 50/60 Hz

- Pages: 6

- Date: 25/05/2025

أ.د. محمد عبد السلام السيد
مدير مركز الخدمة العامة
25/5/2025

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Equipment's Used:

- 1-Insulation Resistance Tester (Megger)
- 2-Fluke 1555,250 V up to 10kV Insulation Tester
- 3-Earth Ground Tester, Fluke1623-2 GEO
- 4-Continuity Digital Meter KYORITSU(DMM)
- 5-H.V, Pure a-c Transformer 50 Hz regulated up to 100 kV
- 6-Pure d-c Unit regulated up to 50 kV
- 7-Multi Stage Impulse generator, 10 units each 100kV(1.2 μ s/50 μ s)
- 8- R, L and C Bridge
- 9- Signal Generator and Oscilloscope
- 10- Accurate Micrometer (TGL 15046/I Skw0.01mm)

Scope:

Calibrating a new fire alarm cable is essential to ensure its reliability, performance and compliance with safety regulations. Fire alarm cables are critical components in fire alarm systems and their proper functioning is vital for early detection and alerting in case of fire.

I-Visual Inspections:

All samples were red in color. It was investigated for any visual defects or irregularities, protrusions or extraneous inclusions, cuts, kinks, free from moisture and contaminants. It showed to be solidly sound without any cracks or traces of corrosion and smooth in touch.

All seem to be made according to the standards.

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II-Dimensions Tests:

Measurements were made using the accurate Micrometer.

Each measurement was repeated five times and the mean value was reported

The cable is composed of a twisted pair of stranded copper conductors(core) insulated with P.V.C (Red and Black) and shielded with copper electromagnetic wires, covered with Thermal mica(Nylon) and rapped with Tin Foil (Aluminum and Polyester).

Shield (copper)

- Number of shield wires and material = 1.0 copper
- Diameter of shield wire = 0.7 mm
- Size Area of shield wire = 0.385 mm²

[Accepted]

Core copper conductors

- Number of strands in core = 48
- Diameter of each strand = 0.20 mm
- Area of each strand = 0.0314 mm²
- Area of core = 1.507 mm²

[Accepted]

- Mean outer diameter of core = 1.17 mm
- Mean thickness of Electrical insulation for core = 0.75 mm
- Mean outside diameter of Insulated core = 2.55 mm
- Mean thickness of Thermal mica(Nylon) = 0.01 mm
- Mean thickness of Tin foil = 0.07 mm
- Mean thickness of Outer P.V.C Jacket(Red) = 1.03 mm

All dimensions and formation of cable are **Accepted**

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المشرف على إعداد ودراسة
البيانات
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III-Electrical Testing :

All grease is removed from the parts to be tested, by cleaning with white spirit. The parts were being dried and then tested.

1- Insulation Resistance test:

An insulation resistance tester(Megger) with test voltage of 500V_{d-c} was applied:

Test between two cores at 20°C $\geq 10 \text{ M}\Omega$

Dry sample between core and ground at 20°C $\geq 10 \text{ M}\Omega$

Sample immersed in tap water at 20°C $\geq 7 \text{ M}\Omega$

Sample immersed in tap water at 105°C $\geq 5 \text{ M}\Omega$

[Accepted]

2- Electrical Continuity:

The resistance between ends of the RED conductor using Digital Multimeter showed to be very low and close to zero $\text{Ohm} \leq 0.1$

[Accepted]

The conductors within the Fire Alarm Cable are continuous and intact.

3- Measurement of Core Resistance:

The core resistance was measured = 11.6 Ω/km

[Accepted]

4- Capacitance Test:

Connect the capacitance bridge to the conductors = 175 nF /km

[Accepted]

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مطابقة للمواصفات المطلوبة
تاريخ: ٢٠٢٥/٥/٢٦

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5- Fire Retardance Test:

Exposure to direct flame: the sample showed to be flammable with white smoke and it extinguished after few seconds, on removal of flame, with no spread of fire along the samples.

[Accepted]

6- Environmental Test:

Fire Alarm cable samples performance under various environmental conditions (temperature range 20-105°C) dry and wet and it showed Consistent performance.

Notes: - This certificate is valid for the tested samples only.

- All tests were repeated for five times and the mean value is reported.

Conclusion:

Tested sample of Fire Alarm Cable comply to the International and the National standards.

Tests Performed by:

A. A. Hossam Eldin



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Prof. Dr. Ahmed A. Hossam-Eldin

Professor of Electrical Materials and Power Engineering

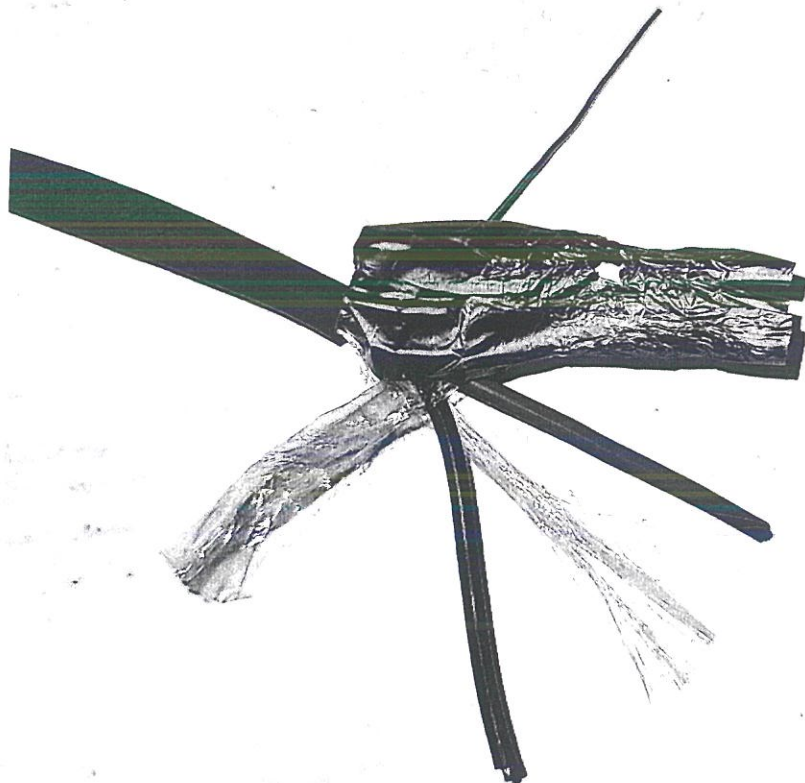
Chairman of High Voltage Group & Supervisor of Laboratory

أ. د. أحمد عبد الله حسن الدين
وفدوا هذه اذنه انما سبيل على اتم



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A. A. Hossam G. El-N

أ. د. (أ. أ. حسان) الأستاذ المساعد في قسم
الهندسة المدنية - جامعة القاهرة



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