SCTE | STANDARDS

Interface Practices Subcommittee

AMERICAN NATIONAL STANDARD

ANSI/SCTE 63 2021

Test Method for Voltage / Spark Test of Outer Jacket

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Document Types and Tags

Document Type: Specification

Document Tags:

☒ Test or Measurement	☐ Checklist	☐ Facility
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☐ Procedure, Process or Method	☐ Cloud	☐ Customer Premises

Document Release History

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SCTE 63 2003	*8/29/2003*
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Note: Standards that are released multiple times in the same year use: a, b, c, etc. to indicate normative balloted updates and/or r1, r2, r3, etc. to indicate editorial changes to a released document after the year.

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1. Introduction

1.1. Executive Summary

Both optical and coaxial cables can adversely be affected by the intrusion of moisture into the cable. The purpose of this standard is to characterize, document and define test methods for voltage / spark testing of cable, outer jackets. The application of this test method for cables during the manufacturing process will aide to ensure the outer jacket integrity and performance by detecting flaws within the outer jacket.

1.2. Scope

This procedure specifies the spark test method to be used in determining if the outer jacket of a coaxial cable will withstand a specified voltage.

1.3. Benefits

SCTE 63 provides cable operators a single reference with regards to voltage / spark testing of cables. Complete outer jacket integrity is critical to exclude moisture from entering the internal components of the cable, and therby degrading the cables life expectancy and performance .

1.4. Intended Audience

Cable operator procurement and technical operation teams will benefit from leveraging this standard.

1.5. Areas for Further Investigation or to be Added in Future Versions

None at time of 2021 update.

2. Normative References

The following documents contain provisions which, through reference in this text, constitute provisions of this document. The editions indicated were valid at the time of subcommittee approval. All documents are subject to revision and, while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

2.1. SCTE References

No SCTE references are applicable.

2.2. Standards from Other Organizations

No normative references are applicable.

2.3. Other Published Materials

No normative references are applicable.

3. Informative References

The following documents might provide valuable information to the reader but are not required when complying with this document.

3.1. SCTE References

No informative references are applicable.

3.2. Standards from Other Organizations

UL 1581 - UL Standard for Safety for Reference Standard for Electrical Wires, Cables, and Flexible Cords

UL 13 - UL Standard for Safety for Power-Limited Circuit Cables

3.3. Other Published Materials

No informative references are applicable.

4. Compliance Notation

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5. Abbreviations and Definitions

5.1. Abbreviations

AC	alternating current
SCTE	Society of Cable Telecommunications Engineers

5.2. Definitions

No definitions at this time.

6. Equipment

6.1. A voltage / spark tester shall include a voltage source capable of maintaining the test voltage as specified in the relevant cable specification. The test fixture shall also have an electrode, a voltmeter, automatic shut-off capability in the event of arcing through the cable jacket material and must be capable of detecting, counting and signaling momentary faults.

6.2. The electrode shall be of chain-link or bead-chain type capable of attachment to the voltage source, and making intimate contact with the jacket of the coaxial cable under test.

7. Voltage Testing

7.1. The test sample is a jacketed coaxial cable of sufficient length to be passed through the bead electrodes of the voltage / spark tester at a maximum defined rate (see Section 7.3) as it is being wound onto the cable reel.

7.2. The outer conductor and the center conductor of the coaxial cable being tested shall be securely bonded to ground at the payoff reel or at any other location which assures a continuous low impedance contact between the outer conductor and the center conductor of the coaxial cable being tested and ground. In addition, the voltage / spark tester shall also be securely bonded to ground.

7.3. Jacketed coaxial cable shall be passed through the link or bead electrode at a maximum defined rate that will insure uniform electrode contact with the moving jacketed cable. The maximum rate at which the jacketed coaxial cable passes through the bead-chain electrode shall keep any point on the jacket in contact with the bead-chain electrode for greater than 18 positive and negative crests of the AC supply voltage (9 complete cycles.) The following formulas, as applicable, may be used to calculate the coaxial cable maximum rate through the voltage / spark tester:

$$RATE_{\max\_in} = \frac{5}{9} * f * L_{in} \text{ in feet per minute}$$

$$RATE_{\max\_mm} = \frac{1}{150} * f * L_{mm} \text{ in meters per minute}$$

where:

$Rate_{max}$ = The maximum rate in feet per minute (3.2.1) or meters per minute (3.2.2) at which the jacketed coaxial cable may pass through the bead-chain electrode.

f = Test frequency of the AC spark tester in hertz.

L_{in} = The electrode (bead chain) length in inches (3.2.1)

L_{mm} = The electrode (bead chain) length in millimeters (3.2.2).

7.4. The test fixture voltage setting shall be adjusted to provide the test voltage specified as continuously indicated by the voltmeter. A fault detector will detect, indicate and count any momentary faults that occur.

7.5. The magnitude of voltage that is applied is proportional to the thickness of the jacket material. Table 1 below provides recommended test voltages, dependent upon the outer jacket thickness. The cable specification and / or safety listing requirements; (examples: UL 1581, paragraph 900; UL 13, paragraph 27) shall be the final authority for the voltage setting.

Table 1 - Jacket Voltage / Spark Test Voltages

Jacket Thickness-inches (mm)	Test Voltage (kilovolts)
Less than 0.020 (0.5)	See Note 1
0.020 (0.5) to 0.030 (0.79)	2.0 kilovolts
0.031 (0.8) to 0.040 (1.0)	3.0 kilovolts
Greater than 0.040 (1.0)	5.0 kilovolts

Note 1: Samples that have a jacket thickness less than 0.020 inches (0.5 mm) should not be subjected to voltage tests.

8. Requirement

The cable under test shall be passed through the bead electrode of the test fixture at a defined rate less than the Ratemax defined in Section 4.3 as it is being wound onto the cable reel. Arcing between the spark test electrode through the cable jacket into the outer conductor shall constitute a failure. The cable under test shall exhibit no more failures per unit length than the maximum specified in the applicable coaxial cable specification.

9. Report

9.1. Each manufacturer conducting voltage testing may report the following information as a minimum on internally developed and approved forms:

9.1.1. The product part number

9.1.2. The date of the voltage / spark test

9.1.3. The jacket type (i.e. PVC or PE)

9.1.4. The voltage level

9.1.5. The number of indicated faults