

SOUTH CAROLINA ELECTRIC COOPERATIVES'

600 VOLT RUGGEDIZED DESIGN UNDERGROUND POWER CABLE SPECIFICATIONS

1.0 SCOPE.

This specification covers the requirements for single and multi-conductor, copper or aluminum, 600 volt phase to phase, 60HZ cables with ruggedized composite cross-linked polyethylene extruded insulations suitable for use in direct burial installation, and installations in ducts, conduits and in air. The cable must be rated at conductor temperatures for continuous operation at 90 degrees Celsius.

- 1.1 Cables shall meet the minimum standards and specifications and all references of:
 - (a) RUS Bulletin 50-71 (U-2), RUS Specifications for 600 Volt Underground Power Cable.
 - (b) ANSI/ICEA S-81-570-1996, Standard for 600 Volt Rated Cables of Ruggedized Design.

2.0 CONDUCTOR CHARACTERISTICS

- 2.1 Conductors shall be copper or aluminum as specified by the purchaser.
- 2.2 Conductor sizes No. 8 AWG through 1000 MCM for copper and aluminum are included.
- 2.3 Copper conductors shall be Class B stranded annealed copper in accordance with ASTM B 3 or ASTM B 8.
- 2.4 Aluminum conductors shall be one of the following as specified by the purchaser:
 - (a) Solid 1350 aluminum either soft, half-hard or three-quarter hard in accordance with ASTM B 230 or ASTM B 609.

- (b) Class B stranded 1350 compressed aluminum either three-quarter hard or hard drawn in accordance with ASTM B 230 or ASTM B 231.
- (c) Compact-round stranded in accordance with ASTM B 400.
- (d) "8000" series aluminum alloy in accordance with ASTM B 800. The conductor temper shall be an intermediate temper, with a tensile strength of 15 to 22 ksi. If stranded, aluminum alloy conductors shall be concentric lay stranded in accordance with ASTM B 801.

2.5 Unilay stranding in accordance with ASTM B 786 (for aluminum 1350 conductors) or ASTM B 787 (for copper conductors) may be used.

3.0 **INSULATION.**

3.1 Insulation shall be the following:

- (a) Abuse resistant (ruggedized) covering shall meet the requirements of ICEA S-81-570 consisting of two (2) composite layers having an inner layer of cross-linked low density polyethylene, Type 1 [Class I (2000 volts and below)] in accordance with ICEA S-66-524 and an outer layer of cross-linked medium or high density polyethylene, Type II or Type III, in accordance with ASTM D 1248. The nominal thickness of either layer shall not be less than thirty-five (35%) percent of the total wall thickness.

3.2 If requested by the purchaser, the cable shall meet the requirements of Underwriters Laboratories, Incorporated for Type USE 600 volt cable.

3.3 The average thickness of the insulation shall not be less than:

| CONDUCTOR SIZE (AWG or kcmil) | INSULATION WALL THICKNESS (mils) |
|--|---|
| 8-2 | 60 |
| 1-4/0 | 80 |
| 250-500 | 95 |
| 525-1000 | 110 |

3.4 The minimum thickness shall not be less than ninety (90%) percent of the above values.

4.0 **MULTI-CONDUCTOR CABLES.**

4.1 Multi-conductor cables, when specified, shall have the following requirements:

- (a) All conductors including the neutral are insulated in accordance with requirements in the above section except that three (3) extruded yellow stripes 120 degrees apart shall be used to identify the neutral.
- (b) For three (3) and four (4) wire construction, the neutral conductor shall not be more than two (2) wire sizes smaller than the phase conductors, and not smaller than specified in Paragraph 2.2
- (c) The conductors of duplex construction shall be of the same size.

5.0 **IDENTIFICATION.**

The manufacturer's name, conductor size, conductor metal, year of manufacture, type of insulation, and sequential footage marks shall be printed clearly on the surface at intervals not greater than two (2') feet. The cable shall also have markings required by national codes.

6.0 **TESTS.**

- 6.1 As a part of a request for RUS acceptance of cable, the manufacturer shall supply to purchaser certified test data demonstrating compliance with this specification.
- 6.2 On all orders of 10,000 feet (3 km) or greater supplied under this specification, the manufacturer shall supply to purchaser a copy of the results of the routine tests required by applicable ICEA publications.
- 6.3 For Type USE cable, the manufacturer shall supply to purchaser the tests required by Underwriters Laboratories.

7.0 **MISCELLANEOUS**

- 7.0 Watertight seals shall be applied to all cable ends.
- 7.2 A durable label shall be securely attached to each reel of cable. This label shall indicate the cable description, feet on reel, tare and gross weight of reel and beginning and ending sequential footage numbers.
- 7.3 Product to be of domestic manufacture.
- 7.4 Reels are to be non-returnable and shall not exceed seventy-two (72") inches in diameter. If required by the purchaser, cable may be provided on returnable reels or in "coils".

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