

15 kV PRIMARY UNDERGROUND EPR CABLE SPECIFICATION

SCOPE

These specifications cover the construction, mechanical and electrical requirements for aluminum conductors insulated with EPR for operation at 15 kV phase to phase.

The cable is intended for operation at 60 Hz single-phase or three-phase (line-to-line) and shall be suitable for operation in conduit, underground duct, riser conduit, for wet and dry locations, and in open air in sunlight. The cable will be used on underground distribution circuits.

GENERAL

Cable purchased under this specification shall comply with the latest AEIC and all applicable ICEA and ASTM specification, with additions and modification as detailed herein. Each manufacturer must submit their latest AEIC qualification acceptance. All manufacturing and testing procedures shall follow ICEA S-94-649, latest edition, concentric neutral cables, 5-46 kV.

The manufacturer must be able to certify a performance record demonstrating a minimum of 30 years successful operating experience for EPR cables in utility and industrial power cable application.

REQUIREMENTS

The cable shall meet the requirements of ICEA S-69-649 and AEIC CS8, latest edition except where it conflicts with the requirements of this specification, in which case this specification shall apply.

BASIC CONSTRUCTION

1/C Class B strand aluminum conductor, triple tandem extruded (three in-line extruders) semi-conducting ethylene-propylene, extruded semi-conducting ethylene-propylene rubber insulation screen, followed by a concentric wrap of copper neutral wires, with an encapsulating polyethylene insulating jacket with three red stripes.

CENTRAL CONDUCTOR

The aluminum shall be per ASTM B-609. Stranded Conductor shall be class B stranded in accordance with ASTM B-231.

Conductors shall meet electrical resistance requirements of ICEA S-94-649.

CONDUCTOR SCREEN

The conductor screen shall be an extruded semi-conducting ethylene-propylene meeting the requirements of ICEA S-94-649. Thickness of the conductor screen shall be in accordance with AEIC CS8. The screen shall be inseparably bonded to the insulation and strip freely from the conductor.

INSULATION

The insulation shall be ethylene propylene elastomer (EPR) and shall meet the requirements of ICEA S-94-649. Insulation thickness shall be 0.220" to provide a 133% insulation level. The City will not accept 0.175" insulated cables.

The insulation shall be suitable for use in wet or dry locations at conductor temperatures not to exceed 105° C for continuous operation, 140° C for emergency overload conditions, and 250° C for short-circuit conditions.

The insulation compound shall be extra clean and stored in a contamination-free bulk handling system to maintain cleanliness prior to conveyance and use in the extruder.

INSULATION SCREEN

The insulation screen shall be an extruded semiconductor meeting the requirements of ICEA S-94-649. The screen compound shall be compatible with the insulation and identified as semi-conducting by surface printing.

The insulation screen shall be clean stripping and have peel strength from the insulation between 3 and 16 lbs/0.5" width when tested per ICEA S-94-649. The thickness of the extruded semi-conducting, EPR screen shall be per ICEA S-94-649-2000, Table 5-1

CONCENTRIC NEUTRAL CONDUCTOR

The neutral wires shall be bare copper, evenly and helically wrapped directly over the insulation screen with a lay of 6-10 times diameter over the wires. The neutral wires shall be full or one-third as required.

OVERALL JACKET

The overall jacket shall be black, sunlight resistant, insulating polyethylene and shall substantially fill the spaces between the concentric neutral wires. The jacket shall be 0.050" minimum average thickness when measured above the neutral wire diameter for conductor size #1/0. The jacket thickness for 750 kcmil shall be 0.080". The jacket shall be free stripping from the insulation screen and concentric neutral wires. Three extruded red stripes shall be applied to the jacket surface spaced 120° apart

CABLE IDENTIFICATION

The outer surface of each cable shall be durably marked throughout its length in accordance with AEIC C8.

An identifying legend shall be printed on the jacket with contrasting ink repeated at 2' intervals with unmarked surfaces not exceeding 6". The legend shall provide the following information:

- ✓ Year of Manufacture
- ✓ Manufacturer name and plant code
- ✓ Conductor Size - either AWG or kcmil
- ✓ AL

Underground Power Construction Standards

- ✓ Voltage
- ✓ Insulation Percent
- ✓ Insulation Thickness
- ✓ Insulation Type
- ✓ Footage at 2' intervals
- ✓ Neutral size

TESTS

The following production tests shall be performed on the cable and submitted to the utility in the form of Certified Test Reports.

A.C. High Voltage test in accordance with ICEA S-94-649-2000.

Corona / partial discharge test shall be performed in accordance with procedures of ICEA publication T-24-380 and X-Y recording graph will be furnished showing the partial discharge results.

PACKAGING AND MARKING

The cable shall be furnished in cutting lengths as single conductor.

The reels shall be substantially constructed non-returnable wood reels to safely carry the weight of the cables. Each reel of cable shall be protected with NEMA Class 2 covering. The bottom and top cable ends shall be properly secured to the reel.

There shall be no water or corrosion in the standard conductor of the completed cable when reel is shipped. Each end of cable shall be capped and sealed watertight to prevent the entrance of moisture into the cable during transit or outdoor storage.

Reels shall be non-returnable, double layered, wood flanged type, substantially constructed to afford proper protection of the cable during shipment and handling. Reels shall have a minimum outside drum diameter not less than prescribed in ICEA A-9-428, for each cable type.

Each reel shall be marked with a weather-resistant label securely attached to a flange of the reel and plainly stating the destination, purchaser's factory production lot identification number, date of manufacture, description of cable, length of cable on reel and gross and tar weight of reel. All reels will be shipped and stored in an upright position. All others will be rejected.

Reel size shall be such to carry an average of 2,500' of cable per reel, unless specified lengths are noted.

QUALIFIED MANUFACTURERS

Supply cables manufactured by Okonite, Prysmian or Kerite only.

INSTALLATION

Distribution primary URD – The following sizes of primary conductor will be accepted on new installations:

- a. 200 amp feeders - #1/0 alum. Kerite, Prysmian, or Okonite, as per Energy Services spec.
- b. 600 amp feeders – 750 kcmil alum. Okonite, Prysmian, or Kerite, as per Energy Services spec.

WARRANTY

Cable suppliers must offer a minimum of a 40 year warranty against electric breakdown due to materials or workmanship.

PRIMARY JUNCTION VAULT SPECIFICATIONS

200 Amp 3-phase or 1-phase above ground primary junction fiberglass vault with fiberglass sleeve

Units must meet the following specifications:

- ✓ Penta head bolts on lid.
- ✓ All hardware including hinges to be stainless steel.
- ✓ Color - Green, desert tan, or willow green.
- ✓ 4-Way Junction required.

Approved Vendors:

Nordic	ND 350 (color) 10/xx (molded enclosures – 3 phase)
Nordic	ND 150 (color) 10/xx (molded enclosures - 1 phase)

Vault installations will include three 4-way junctions, parking bushings, stingerless DR caps, arrester elbows, ground rods and all ground lugs.

600 Amp 3 phase above ground primary junction fiberglass vault

Nordic ND-683054-MG-PA71-X-X

On installation of 600 Amp primary vaults, coordinate all terminations and materials with SGES.