



**Equipment Specification**

Document No.: 4350.052

Item No.: 006-00734

Asset Suite: 54025

Originating Department: Distribution Engineering



## **Solid Copper Cable, 3/C, 12 AWG, Type UF**

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### **1. Introduction**

This is a general specification that covers the minimum requirements for a copper cable, Type UF, 3/C, 12 AWG to be used in the distribution system in Puerto Rico. Further information will be provided by LUMA Energy at the time of order placement and will provide information on site specific conditions, quantity, and other requirements. This document includes the general electrical and mechanical characteristics of the material.

### **2. Special Requirements**

- 2.1. Samples shall be furnished as requested by LUMA Energy. All documented testing required by applicable specifications and standards shall be submitted with product samples, including mechanical drawings, prior to approval. Vendors that have supplied this material to PREPA/LUMA on previous orders, will not have to furnish samples at bid opening. With the exception if any material or design changes were made to an approved product, vendor must re-submit sample to the Material Specification engineer for approval before shipping. The material will be received at the LUMA's general warehouse (011) at Palo Seco, Puerto Rico. Shipping will include transportation and unloading at the indicated warehouse.
- 2.2. Product shall be manufacture in accordance with the latest issue ASTM, NEMA, IEEE and ANSI specification. When conflicts occur between Purchaser's specifications and the ASTM, NEMA, IEEE, or ANSI specifications, the Purchaser's specification shall prevail. The product shall be furnished as described here in this specification or as amended by the purchase order. Any changes or updates to the Supplier's procedures, quality routines, and/or inspection layout shall be liable for all costs incurred for product that is refused/rejected.
- 2.3. Upon inspection of incoming material, the purchaser reserves the right to refuse product shipments and to determine the acceptability or rejection of product received. The Supplier shall be liable for all costs incurred for product that is refused/rejected.
- 2.4. Vendor shall submit two (2) quotes: one for conductor on steel reel and another for conductor on wood reel. See detail of reels in section 6.



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### **3. Quantity/Literature**

Descriptive and technical literature must be supplied by vendor at time of bidding. This literature may include, but is not limited to details of material, drawings, documented testing, and instructions for use and installation. Failure to submit documents on time will cause bidder disqualification. For products described in this specification as requiring qualification, awards will be made only for such products that, prior to the time for opening of bids, had been tested and/or approved by LUMA. Evidence of PREPA's and/or LUMA Energy's approval of the equipment or material shall be supplied by vendor if requested by LUMA Energy.

### **4. Markings**

- 4.1. Cable reels shall be marked outside with LUMA Energy's purchase order, item number, description of wire & specification date, code name, net length & size, gross & tare weights, and manufacturer's name & lot/production number.
- 4.2. Packaging labels and tags shall be waterproof.

### **5. Equal or Approved Equal to**

American Wire Group (Item #: UFB-10).

### **6. Packaging**

- 6.1. All material and equipment shall be packaged and marked in such a way as to facilitate handling and protection from damage and that the receiving warehouse can readily identify it and send it, in one complete unit, to a field location without opening crates or boxes to sort items and/or parts.
- 6.2. Shall be shipped continuous in a non-returnable new reel containing 1,000 ft (304.8 m). Cable won't be accepted by sections less than 1,000 ft (304.8 m).
- 6.3. Reels shall be made of treated wood conforming with AWPA (U1 & T1-17), with a retention of 0.3 lbs/cu ft (4.81 kg/cu m) of pentachlorophenol or chromated-cooper-arsenate (CCA).
- 6.4. Treatment material shall comply with AWPA P9.
- 6.5. Steel reel consisting of a finishing high pressure hot phosphate wash and bonding agent, zinc chromate-iron oxide primer, and a final enamel coat to provide the necessary extra durability will be accepted.



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- 6.6. Reels shall have a minimum arbor hole diameter of 2.5" (6.35 cm).
- 6.7. The upper layers shall be protected with pieces of wood along the transverse section of the reel for cable protection with NEMA level 2 wrapping of protective material and the cable ends shall be protected from water entrance or any damage by means of an adequate seal.
- 6.8. Cable ends shall be firmly and properly secured.
- 6.9. Other types of reels will be evaluated by Luma Energy.

### **7. Number Per Package (Logistics)**

One thousand feet (304.8 m) per reel.

### **8. Acceptance Criteria**

- 8.1. Test required: certified by external laboratories.
- 8.2. Latest applicable codes, standards, and other regulations: ANSI/ASTM (B3, B8), AWPA (P9, U1, T1), UL (83, 493), NEC (336, 339).
- 8.3. NEMA Standard Publication No. WC 26 – Binational Wire and Cable Packaging Standard.

### **9. Description**

- 9.1. This is commonly used for secondary circuit connections in underground systems.
- 9.2. The UF underground feeder cable (UL) shall consist of three solid copper conductors no. 12 AWG as per ANSI B3, rated at 600 V.
  - a. Two of them will be circuit conductors and shall be insulated individually with polyvinyl chloride (PVC) as per UL 83.
  - b. The other one shall be bare annealed wire as per ASTM B3, located in an interstice between the two circuit conductors.
  - c. All wires shall be jacketed with chemical, moisture, and sunlight resistance PVC.
  - d. Temperature rating shall be 60°C (140°F) in wet, dry, or corrosive locations.
  - e. Cable shall be UL type in accordance with standards UL 83 and 493, federal specification no. J-C-30, and national electrical code (NEC).



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**10. Inspection**

The acceptance of any material or equipment shall in no way relieve the vendor from his responsibility to meet all the requirements of this specification, and it would not prevent subsequent rejection if such materials were found later to be defective.

**11. Warranty**

The conductor shall be designed and manufactured to provide a minimum life expectancy of 40 years. Replacement costs associated with premature conductor failure due to inadequate design of faulty manufacturing is to be the responsibility of the Supplier. The manufacturer shall guarantee that each part of the finished conductor has been manufactured in accordance with requirements of the referenced specifications and standards and that the finished conductor complies with the same requirements. The supplier/manufacturer shall agree to replace any length of conductor for two years after date of delivery if defective material or workmanship is found during installation or if the conductor fails from normal use during its first year of service. In either case, the supplier/manufacture shall be given a reasonable opportunity to inspect such defect or failure. A technical report detailing the cause(s) of the defect and the corrective measures implemented to prevent recurrence shall be provided upon request of the purchaser.

— End of Specification —

**Document History**

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