



Document Title:

# Copper Cable For Grounding

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## Document History

Date	Revision Comments
Apr. 25, 2022	Initial release for item 072-02898
Sep. 12, 2022	Page cover added and items 072-02724 and 072-83420 added.

Warehouse Catalog	Item Version	Date
072-02724	3	09/12/2022
072-02898	2	09/12/2022
072-83420	1	09/12/2022



## Equipment Specification

Document No.: 4350.234

Originating Department: Distribution Engineering



## Copper Cable for Grounding

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### 1. Introduction

This is a general specification that covers the minimum requirements for the grounding copper cable 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.



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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**

Hastings. See Table 2 for suggested model.

### **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. Cable shall be shipped in a non-returnable reel/spool, containing 1000 ft. (304.8 m) continuous. Cable won't be accepted by sections.
- 6.3. Each end of the cable shall be firmly and properly secured to reel/spool.
- 6.4. Reels/spools shall be protected against damage in ordinary handling and shipping.
- 6.5. Manufacturer shall protect cable ends from water entrance or damage by means of an adequate seal.

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

1000 ft. (304.8 m) per reel/spool or as requested by LUMA.



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### 8. Acceptance Criteria

- 8.1. Test required: certified by external laboratories.
- 8.2. Latest applicable codes, standards, and other regulations: National Electrical Code (NEC), ASTM F855

### 9. Description

- 9.1. This cable is used for protective grounding of de-energized circuits. Recommended for safety grounding in distribution and transmission lines.
- 9.2. Shall be a copper, multi stranded single conductor.
- 9.3. Shall meet ASTM F855
- 9.4. Cable shall be Type I, Class K, grounding cable.
- 9.5. Strand size shall be #30 AWG or 0.0100 inch in diameter.
- 9.6. Cable shall be covered with a high visibility color flexible PVC jacket. Jacket shall be weather, oil, and abrasion resistant.
- 9.7. Cable shall be flexible for easy handling.
- 9.8. Table 1: Characteristics by cable size:

Size (AWG)	Strands as per ASTM F855	Approximate Wire Diameter Inches (cm)	Jacket Thickness	Approximate Overall Diameter	Approximate Weight Lb/MFT
1/0	1064	0.410 (1.041)	75 mils	0.570 (1.45 cm)	414
2/0	1323	0.470 (1.19 cm)	75 mils	0.620 (1.57 cm)	504
4/0	2107	0.590 (1.50 cm)	75 mils	0.740 (1.88 cm)	775

- 9.9. Table 2: Warehouse and Model Information

Cable Size	Warehouse Catalog	Suggested Manufacturer Model
1/0	072-02724	9201
2/0	072-02898	13698
4/0	072-83420	9228

### 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.



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### **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 or 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/manufacturer 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.

### **12. Proposal Information**

12.1. Submitted proposals must include:

- a. Technical information
- b. Table of Compliance completed by the bidder with reference. (See Appendix 1)

— End of Specification —



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# **Appendix**



**Equipment Specification**

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## Copper Cable for Grounding

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### Appendix 1: Table of Compliance

Line	Criteria	Description	Pass/Fail (P/F)	Comments
1	Specification	The Proponent complies with the corresponding specification document 4350.234.		
2	Industry Standards	The Proponent complies with the industry standards established in the specification document.		
4	Material	Copper		
5	Strands	Strand size shall be #30 AWG or 0.0100 inch in diameter. <ul style="list-style-type: none"><li>• 1/0 1064</li><li>• 2/0 1323</li><li>• 4/0 2107</li></ul>		
6	Jacket	Cable shall be covered with a high visibility color flexible PVC jacket. Jacket shall be weather, oil, and abrasion resistant. Thickness: 75 mils.		
7	Approximate Overall Diameter	<ul style="list-style-type: none"><li>• 1/0: 0.570 (1.45 cm)</li><li>• 2/0: 0.620 (1.57 cm)</li><li>• 4/0: 0.740 (1.88 cm)</li></ul>		











# 4350.234 Copper Cable for Grounding Single Conductor (09-12-2022)

Final Audit Report

2022-09-28


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