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Copper Ground Rod, Coupling, Driving Head, and Connector.

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Related/Referenced Documents

N/A.

Version History

Version	Date	Revision
01	Apr 12, 2022	New specification document created for existing item 002-02465 (Ver. 6).
02	July 18, 2022	<ul style="list-style-type: none"> Consolidated specification document 4350.078 into this document. Modified document title for better item identification. Modified <i>Section 7: Number per Package</i> Modified <i>Section 9: Description</i>. Modified item description for 002-02465, included item description for 002-13595, and included item description for ground rod coupling and driving head for installation. Adjusted TOC. New item numbers created for 002-83223 and 002-83224.
03	Aug 02, 2022	<ul style="list-style-type: none"> Modified Section 9.1. to change length of rod. Added Section 9.4. and 9.6. for new items. Adjusted TOC. New item code created for Copper Rod, Unthreaded Coupling, and Unthreaded Driving Head for Installation.
04	Jul. 19, 2024	<ul style="list-style-type: none"> Format corrections, TOC update, Section 4 modified, and sections order rearranged.



Item Version History

Warehouse Catalog #	Asset Suite	Version	Date
002-83238	83238	2	07/19/2024
002-13595	57693	4	07/19/2024
002-83223	83223	3	07/19/2024
002-83224	83224	3	07/19/2024
002-83239	83239	2	07/19/2024
002-83240	83240	2	07/19/2024



1. Introduction

This is a general specification that covers the minimum requirements for the copper ground rod and accessories 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 equipment/material.

2. Special Requirements

Samples shall be furnished as requested by LUMA Energy. Vendors that have supplied this equipment/material to LUMA on previous orders will not have to furnish samples at bid opening. The equipment/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.

3. Literature

Descriptive and technical literature must be supplied by the 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.

4. Compatible with

For compatible manufacturers and models see Table 1. These models are examples of the equipment/material described in this document and do not represent a preference. LUMA will evaluate equally any model not listed here during any acquisition event.

5. Markings

- 5.1. Containers shall be marked outside with LUMA Energy's purchase order, item number, name and size, net and gross weight, manufacturer's name, and lot number.
- 5.2. Rod shall be permanently stamped with length of rod near its top and copper sheath thickness along its length.
- 5.3. Packaging labels and tags shall be waterproof.

6. Packaging

All equipment/material 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.

7. Number Per Package (Logistics)

- 7.1. Threaded Ground Rod: Fifty (50) per package or as required by LUMA Energy.
- 7.2. Connector: Twenty-five (25) per package or as required by LUMA Energy
- 7.3. Threaded Coupling: Twenty-five (25) per package or as required by LUMA Energy
- 7.4. Threaded Driving Head: Twenty-five (25) per package or as required by LUMA Energy
- 7.5. Unthreaded Coupling: Twenty-five (25) per package or as required by LUMA Energy
- 7.6. Unthreaded Driving Head: Twenty-five (25) per package or as required by LUMA Energy

8. Acceptance Criteria

- 8.1. Test required: certified by external laboratories.
- 8.2. Product shall be manufactured in accordance with the latest issue below (section 8.3). When conflicts occur between purchaser's specifications and the latest issue below, the purchaser's specification shall prevail.
- 8.3. Latest applicable codes, standards, and other regulations:
 - a. ANSI/NEMA (GR1): Ground Rod Electrodes and Ground Rod Electrode Couplings
- 8.4. If any other standard different from the ones indicated in this document are used, the supplier must provide information showing compatibility with the required ones.

9. Description

9.1. Threaded Copper Ground Rod

- a. Electrical grounding rod made of a true carbon steel core with a pure copper sheath of 0.010 in (0.25 mm) uniform minimum thickness.
- b. The copper bonded rod shall be manufactured by the electro-forming process.
- c. The steel point shall be conical permitting easy driving into the ground without distorting.
- d. The top end shall be chamfered to avoid mushrooming while driving.
- e. Dimensions
 - 1. Length: 4 ft. (243.84 cm)
 - 2. Diameter: 5/8 in. (1.59 cm)

- f. The rod must be manufactured with threaded ends at both sides. Each shall be 11 threads per inch (tpi).

9.2. **Connector for Copper Ground Rod**

- a. Copper alloy clamp with hexagonal head bolt for 5/8 inches (1.59 cm) diameter ground rod
- b. Clamp shall provide a permanent, low-resistance, copper to copper connection.
- c. Shall accept copper conductors ranging in size from 6 solid to 1/0 stranded.

9.3. **Threaded Coupling for Copper Ground Rod**

- a. Copper or bronze alloy coupling for threaded 5/8 inches (1.59 cm) diameter ground rod.
- b. Diameter shall be 5/8 inch so it will be able to accept 5/8-inch (1.59 cm) diameter ground rods on both sides of the coupling. Threads shall be 11 tpi.
- c. Length shall be at least 2.75 in. (6.985 cm)
- d. Coupling shall provide a permanent, low-resistance, copper to copper connection.
- e. Thickness shall be a minimum of 0.010 inch (0.254 mm) or 10 mill copper.

9.4. **Unthreaded Coupling for Copper Ground Rod**

- a. Copper or bronze alloy coupling for unthreaded 5/8 inches (1.59 cm) diameter ground rod.
- b. Diameter shall be 5/8 inch so it will be able to accept 5/8-inch (1.59 cm) diameter ground rods on both sides of the coupling.
- c. Length shall be at least 2.75 in. (6.985 cm)
- d. Coupling shall provide a permanent, low-resistance, copper to copper connection.
- e. Thickness shall be a minimum of 0.010 inch (0.254 mm) or 10 mill copper.

9.5. **Threaded Drive Head for Copper Ground Rod Installation**

- a. 5/8" drive head used for protection of ground rod during installation.
- b. Shall be threaded with 11 threads per inch and suitable for use with 5/8" ground rod coupling. Driving head shall be able to be installed in a compatible threaded coupling.
- c. Material shall be steel.



9.6. Unthreaded Drive Head for Copper Ground Rod Installation

- a. 5/8" drive head used for protection of ground rod during installation.
- b. Shall be unthreaded suitable for use with 5/8" ground rod coupling. Driving head shall be able to be installed over the ground rod top end.
- c. Material shall be steel.

10. Inspection

The acceptance of any equipment/material 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 equipment/materials were found later to be defective.

11. Proposal Information

11.1. Submitted proposals must include:

- a. Technical information, tests, and drawings.
- b. Table of Compliance completed by the bidder with reference (see Appendix 1).

12. Table 1: Warehouse and Asset Suite Identification Number

12.1. Table 1: Ground Rod and Accessories Warehouse Information

Item	Warehouse Number	Asset Suite	Threaded	Equal or similar to
5/8" x 4' Threaded Ground Rod	002-83238	83238	Yes	Hubbell C635840
Connector for Copper Ground Rod	002-13595	57693	N/A	Maclean Power Systems JAB58H
Threaded Coupling for Cooper Ground Rod	002-83223	83223	Yes	Hubbell CTC58 Maclean Power System J9182
Threaded Drive Head for Copper Ground Rod	002-83224	83224	Yes	Hubbell CTDH58
Unthreaded Coupling for Cooper Ground Rod	002-83239	83239	No	Hubbell CCC58
Unthreaded Drive Head for Copper Ground Rod	002-83240	83240	No	Hubbell CDH58

— End of Specification —



Appendix



Appendix 1: Ground Rod Table of Compliance

Line	Criteria	Description	Pass/Fail (P/F)	Comments
1	Specification	The Proponent complies with the corresponding specification document. (4350.089)		
2	Industry Standards	The Proponent complies with the industry standards established in the specification document. (ASTM, NEMA)		
3	Dimensions	5/8" diameter x 4 ft long		
4	Material	True carbon steel core with copper sheath of 0.01" minimum thickness		
5	Construction	<ul style="list-style-type: none">The rod must be manufactured with threaded ends at both sides. Each shall be 11 threads per inch.The steel point shall be conical permitting easy driving into the ground without distorting.		

Appendix 2: Connector for Ground Rod Table of Compliance

Line	Criteria	Description	Pass/Fail (P / F)	Comments
1	Specification	The Proponent complies with the corresponding specification document (4350.089).		
2	Industry Standards	The Proponent complies with the industry standards established in the specification document. (ANSI/ASTM)		
3	Material	Copper Alloy		
4	Bolt Type	Hexagonal		
5	Bolt Diameter	5/8 in.		
6	Conductor compatibility	Copper conductors ranging in size from 6 solid to 1/0 stranded.		



Appendix 3: Coupling for Copper Ground Rod Table of Compliance

Line	Criteria	Description	Pass/Fail (P / F)	Comments
1	Specification	The Proponent complies with the corresponding specification document (4350.089).		
2	Industry Standards	The Proponent complies with the industry standards established in the specification document. (ANSI/ASTM)		
3	Material	Copper Alloy (10 mill min. thickness) or bronze alloy		
4	002-83223	Compatible with threaded ground rod.		
5	002-83239	Compatible with unthreaded ground rod.		
6	Length	2.75 inch		
7	Rod Diameter	5/8 in.		

Appendix 4: Driving Head for Copper Ground Rod Table of Compliance

Line	Criteria	Description	Pass/Fail (P / F)	Comments
1	Specification	The Proponent complies with the corresponding specification document (4350.089).		
2	Industry Standards	The Proponent complies with the industry standards established in the specification document. (ANSI/ASTM)		
3	Material	Steel		
4	002-83224	Shall be threaded with 11 threads per inch and suitable for use with 5/8" threaded ground rod coupling.		
5	002-83240	Shall be compatible to be installed over unthreaded ground rod.		

NOTE: These tables are only a check list for reference. The compliance shall be with the complete document. Marking a **PASS** in the table won't be accepted as a compliance without the technical information required to certify it.











4350.089 Ground Rod & Accesories (7-19-2024)

Final Audit Report

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