	Document Title: Aluminum Conductor, AAAC Spacer Cable, 15 kV				
People first. Safety always.	Document Type: Specification		Engineering Type Material Specification	Document No.: 4350.315	
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* Select the Departments impacted by the document (If app	ly)		For others, specify here		
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Management Approval (If apply)					

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Position	

Related/Referenced Documents

N/A

Version History

Version	Date	Revision
01	Jun. 02, 2023	Initial Release
02	Jun. 21, 2023	Section 9.4.c modified. Table 1 (OD column, cm info) modified.
03	Dec. 15, 2023	General format modifications and adding requirement to include "Property of PREPA" and SFM as part of the jacket markings.
04	Jun. 09, 2025	General format modifications and new Item created (042-87562).





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Item Version History

Warehouse Catalog #	Asset Suite #	Version	Date
042-87562	87562	1	06/09/2025
042-84857	84857	4	06/09/2025
042-84858	84858	4	06/09/2025
042-84859	84859	4	06/09/2025
042-84860	84860	4	06/09/2025







1. Introduction

This is a general specification that covers the minimum requirements for all aluminum-alloy conductors (AAAC) spacer 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 characteristics of the equipment/material.

2. Special Requirements

- 2.1. Samples shall be furnished as requested by LUMA Energy. Vendors that have supplied this material to LUMA on previous orders will not have to furnish samples at the bid opening. If any material or design changes were made to an approved product, the vendor must re-submit a sample to the material specification engineer for approval before shipping. The equipment/material will be received at LUMA's general warehouse (011) at Palo Seco, Puerto Rico. Shipping will include transportation and unloading at the indicated warehouse.
- 2.2. The vendor shall submit two (2) quotes: one for conductors on steel reel and another for conductors on wood reel. See detail of reels in section 6.

3. Literature

- 3.1. Descriptive and technical literature must be supplied by the vendor at time of bidding. This literature must include, but is not limited to, details of material, drawings, documented testing, and instructions for use and installation. The literature must be an official document from and certified by the manufacturer. Failure to submit documents on time and duly certified by the manufacturer will cause bidder disqualification.
- 3.2. If required by LUMA, final drawings and documentation shall be submitted by the vendor before the manufacturing and shipping process for approval.





4. Compatible with

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

6. Packaging

- 6.1. 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.
- 6.2. The conductors shall be shipped in non-returnable new reels of continuous conductor. Conductors won't be accepted by sections.
- 6.3. Wood 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-copper-arsenate (CCA).
- 6.4. Treatment material shall comply with AWPA P9.
- 6.5. Steel reels shall consist of a high-pressure hot phosphate wash and bonding agent finish, zinc chromateiron oxide primer, and a final enamel coat to provide the necessary extra durability.
- 6.6. Reels shall have a minimum arbor hole diameter of 2.5" (6.35 cm).
- 6.7. Each end of the conductor shall be firmly and properly secured to reel.
- 6.8. Reels shall be protected against damage in ordinary handling and shipping.
 - a. Manufacturers shall protect the upper layers with pieces of wood along the transverse section of the reel for conductor protection NEMA level 2 wrapping of protective material.





- b. Manufacturers shall protect conductor ends from water entrance or damage by means of an adequate seal.
- 6.9. Other types of reels will be evaluated by Luma Energy.

7. Number Per Package (Logistics)

Twenty-five hundred feet (2,500 ft) per reel, approximate length, or as requested by LUMA.

8. Acceptance Criteria

- 8.1. Test required: certified by external qualified 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/ASTM B398: For Aluminum-Alloy 6201-T81 and 6201-T83 wire for electrical purposes.
 - ANSI/ASTM B399: For concentric-lay-stranded conductors, made from round aluminum-alloy 6201-T81 (hard: solution heat-treated, cold worked, and then artificially aged) wires, for use for electrical purposes.
 - c. ICEA S-121-733: For materials, constructions, and testing of tree wire and messenger supported spacer cable. Covers both thermoplastic and crosslinked polyethylene constructions, rated for 75°C or 90°C normal conductor temperatures respectively.
 - d. AWPA P9: For solvents and formulations for organic preservative systems.
 - e. AWPA U1 & T1: For wood treatment.
 - f. NEMA WC 26: Binational Wire and Cable Packaging Standard.
- 8.4. If any other standard different from the ones indicated in this document is used, the supplier must provide information showing compatibility with the required ones.





9. Description

- 9.1. These cables are used for construction and maintenance of the electrical distribution systems where limited space is desirable or to avoid faults where tree limbs or other objects could be in contact with the cable.
- 9.2. Shall be rated at 15 kV and consists of a concentric lay stranded all aluminum alloy conductor (AAAC) with a 3-layer insulation.
- 9.3. Conductor Material: Aluminum Alloy 6201-T81
- 9.4. Insulation (3-layer):
 - a. Shall have a conductor shield of extruded semiconductor cross linked polymer not less than 15 mils
 (0.38 mm) thickness. Not less than 20 mils (0.51 mm) for cables above 600 MCM.
 - b. Shall have an inner layer of low density track resistant crosslinked polyethylene (LDTRXLPE) with not less than 75 mils (1.9 mm) thickness. Not less than 80 mils (2.03 mm) for cable 927.2 MCM.
 - c. Shall have an outer layer of high density track resistant crosslinked polyethylene (HDTRXLPE) with not less than 75 mils (1.9 mm) thickness and shall be weather and sunlight resistant. Not less than 80 mils (2.03 mm) for cable 927.2 MCM.
- 9.5. The outside cable jacket markings shall include "Property of PREPA", sequential footage marks (SFM), and all required markings as per the applicable standards and regulations. The supplier shall provide an example of the final legend at bid opening.
- 9.6. For Size, Strands, Diameter, Weight, Ultimate Strength, and Current Rating see Table 1.

10. Inspection

- 10.1. Upon inspection of incoming equipment/material, the purchaser reserves the right to refuse product shipments and to determine the acceptability or rejection of the product received. The supplier shall be liable for all costs incurred for a product that is rejected.
- 10.2. 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, drawings, and tests.
 - b. Table of Compliance completed by the bidder with reference (see Appendix 1).

12. Warranty

The conductor/cable shall be designed and manufactured to provide a minimum life expectancy of 40 years. The supplier/manufacturer shall guarantee that each part of the finished cable has been manufactured in accordance with the requirements of the referenced specifications and standards. The supplier/manufacturer shall agree to replace any length of conductor for two years after the date of delivery if defective material or workmanship is found during installation or if the cable fails from normal use during its first year of service free of cost for the purchaser. In either case, the supplier/manufacturer shall be given a reasonable opportunity to inspect such defects or failures. 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.

13.	Table 1: Warehouse and Asset Suite Identification Number
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ltem Size (MCM)	Warehouse Catalog #	Asset Suite #	Conductor Diameter	Overall Diameter	Strands	Ampacity Rating	Approx. Ultimate Strength	Approx. Weight Ibs./1k ft	Compatible Manufacturer
48.60	042 97562	97560	0.250"	0.580"	7	143	1,584 lbf	137	Southwire
40.09	042-87 302	0/ 502	(0.6 cm)	(1.5 cm)	1		(7.0 kN)	(204 kg/km)	Viakon
105.7	10E 7 0/2 0/0E7	0/057	0.502"	0.832"	7	342	6,111 lbf	334	Southwire
195.7	042-04057	04057	(1.3 cm)	(2.1 cm)			(27.2 kN)	(498 kg/km)	Viakon
20/ F	394.5 042-84858 84858 0.721" 1.050" 19 19	0/050	0.721"	1.050"	10	E22	11,970 lbf	568	Southwire
394.5		332	(53.2 kN)	(847 kg/km)	Viakon				
(52)	0/2 0/050	84859	0.927"	1.267"	19	720	19,710 lbf	894	Southwire
052.4	042-84859		(2.4 cm)	(3.2 cm)		729	(87.7 kN)	(1,333 kg/km)	Viakon
927.2	0/2 0/000	860 84860	1.108"	1.468"	37	908	27,450 lbf	1,183	Southwire
	042-84860		(2.8 cm)	(3.7 cm)			(122.1 kN)	(1,764 kg/km)	Viakon





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14. Table 2: AAAC Spacer, ACSR Spacer, and CU 5 kV Equivalences by Size, Strands,

Ampacity, Strength, Weight, and Overall Diameter (OD)

Туре	Cable Characteristics					
	Size	48.69 MCM	195.7 MCM	394.5 MCM	652.4 MCM	927.2 MCM
	Strands	7	7	19	19	37
AAAC	Current	143 A	342 A	532 A	729 A	908 A
15 kV	Strength	1,584 lbf	6,111 lbf	11,970 lbf	19,710 lbf	27,450 lbf
	Weight	137 lbs/k ft	334 lbs/k ft	568 lbs/k ft	894 lbs/ k ft	1,183 lbs/k ft
	OD	0.580"	0.832"	1.050"	1.267"	1.468"
ACSR 15 kV	Size		3/0 AWG	336.4 MCM	556.5 MCM	795.0 MCM
	Strands	N/A	6/1	18/1	24/7	26/7
	Current		315 A	519 A	721 A	907A
	Strength		6,289 lbf	8,246 lbf	18,810 lbf	29,900 lbf
	Weight		393 lbs/k ft	570 lbs/k ft	949 lbs/k ft	1,423 lbs/k ft
	OD		0.832"	1.014"	1.254"	1.468"
	Size	6 AWG				N/A
	Strands	1				
CU 5kV	Current	75 A				
	Strength	762.9 lbf	N/A	N/A	N/A	
	Weight	172 lbs/k ft				
	OD	0.534"				

—End of Specification —





Appendix





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Appendix 1: Table of Compliance

Line	Description	Pass/Fail	Comments
1	Complies with document 4350.315.		
2	Industry Standards: ASTM (B398, B399), ICEA S-121-733		
3	Tech. info., drawings, and tests provided.		
4	AAAC Spacer Cable, 3-Layer, 15 kV		
5	Aluminum Alloy 6201-T81		
6	Size as per Table 1.		
7	Concentric Lay Stranded		
8	Conductor Shield: Extruded Semiconductor Cross Linked Polymer, 15		
8	mils minimum thickness (20 mils above 600 MCM).		
9	Inner Layer: LDTRXLPE, 75 mils minimum thickness (80 mils for 927.2		
, 	MCM).		
10	Outer Layer: HDTRXLPE, 75 mils minimum thickness (80 mils for 927.2		
	MCM).		
11	Ampacity Rating as per Table 1.		
12	Ultimate Strength: as per Table 1.		
13	Conductor Diameter: as per Table 1.		
14	Overall Diameter: as per Table 1.		
15	Strands: as per Table 1.		
16	Jacket markings: "Property of PREPA", SFM, and all required as per the		
10	applicable standards and regulations.		

NOTE: This table is only a checklist for reference. The compliance must be with the complete document. Filling out the table with "PASS" won't be accepted as a compliance without the technical information required to certify it.



4350.315 AAAC Spacer Cable (6-9-25)

Final Audit Report

2025-06-09

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