

1.0 SCOPE

This specification covers the minimum requirements for bare aluminum conductors to be used in overhead primary voltage distribution, 15 kV maximum.

2.0 PRODUCT REQUIREMENTS

2.1. General Requirements

2.1.1. Conductor Identification

Reel markings on weather resistant reel tags are to include: shipping location, length of cable, gross, net and tare weights, purchase order number, manufacturer's name, date of manufacture, conductor size and stranding, conductor codename (if applicable), manufacturer's production run number, reel serial number, and DOP Division ID.

2.1.2. Packaging

Reels shall have 18 to 24 inches of inside tail wire exposed through the reel starthole (nearest flange when cable pay-off is in a clockwise direction) and secured to the reel flange. The non-returnable (NR) wooden reels shall have 3 inch minimum diameter center arbor holes and 1½ inch minimum diameter drive pin holes located 6 to 21 inches from the spool flange center per NEMA WC26. Both ends of each conductor length shall be sealed with an end cap or hermetically as to provide suitable mechanical protection for safety of all personnel. Unless specified otherwise on the purchase order, detailed cable packaging is described within each product category below. Please note that these packaging requirements do not apply to Section 2.5 (Aluminum Tie Wire) or Section 2.6 (Guy Wire), which shall be packaged in coils.

2.1.3. Shipping and Quality Assurance Requirements

To prevent damage, reels shall be securely blocked in an upright position so that they will not shift during transit. Reels shall not be stacked, nor shall other material be stacked on the reels.

Quality assurance documentation and information on the manufacturer's quality control program shall be furnished upon request. Furthermore, the manufacturer's facilities shall be open for inspection by the purchaser, for quality assurance purposes, upon request.

2.2. **All Aluminum Conductor (AAC)**

2.2.1. **Purpose**

This conductor is used for overhead primary distribution, where ampacity must be maintained and a lighter conductor is desired, and when conductor strength is not a critical factor.

2.2.2. **Product Description**

Conductor shall be bare aluminum 1350-H19 wires, concentrically stranded. The outer layer on shall be right hand lay.

2.2.3. **Applicable Codes and Standards**

The conductor in this specification shall meet and/or exceed all requirements of the latest editions of the standards listed below. The conductor shall further meet and/or exceed those applicable standards not stated herein but referenced by the below standards.

- a) ASTM B230 – Standard Specification for Aluminum Conductors, 1350-H19 for Electrical Purposes
- b) ASTM B231 – Standard Specification for Aluminum Conductors, Concentric-Lay-Stranded 1350 Conductors

2.2.4. **Standard Conductor Sizes**

Conductor supplied under this category shall be sized per the table below:

Code Name	Size (kcmil)	Stranding	Approx. Weight (lbs/1000')	Breaking Strength (lbs)	Division ID
Cosmos	477	19	447	8,360	78839

2.2.5. **Packaging**

Conductor shall be packaged in accordance with Section 2.1.3 and the table below:

Code Name	Size (kcmil)	Approx. Feet Per Reel	Max. Flange Diameter (in.)	Max Overall Reel Width (in.)	Division ID
Cosmos	477	3,000	42	33	78839

2.3. **All Aluminum Alloy Conductor (AAAC)**

2.3.1. **Purpose**

The conductor is used for overhead primary distribution. It uses a high-strength aluminum-alloy to achieve a high strength-to-weight ratio and affords good sag characteristics.

2.3.2. **Product Description**

Conductor shall be bare aluminum-alloy 6201-T81 wires, concentrically stranded. The outer layer on shall be right hand lay.

2.3.3. **Applicable Codes and Standards**

The conductor in this specification shall meet and/or exceed all requirements of the latest editions of the standards listed below. The conductor shall further meet and/or exceed those applicable standards not stated herein but referenced by the below standards.

- a) ASTM B398 – Standard Specification for Aluminum-Alloy 6201-T81 Wire for Electrical Purposes
- b) ASTM B399 – Standard Specification for Concentric-Lay-Stranded Aluminum-Alloy 6201-T81 Conductors

2.3.4. **Testing**

All 6201, AAAC conductors shall be tested for conductor spring back (also known as conductor “memory” or “coil back”). Frequency of spring back testing shall be completed at the beginning of every strander set-up, changeover, shift change, component change, and order change. Spring back testing shall also be performed at least two times during each shift operation. Every reel that is tested for spring back requires a test tag to be applied to the tested reel. To adequately measure allowable spring back tolerances, a 30 foot minimum sample should be prepared in the following manner:

- a) With the reel of conductor to be inspected placed on a take-up stand, pull off approximately 30 feet of conductor from the reel (Note: the conductor sample need not be cut from the reel). While maintaining hand control of the loose end, relax the tension if the conductor does not retract to a coil spring shape. Next, re-apply tension by hand to straighten the 30 foot length of conductor.
- b) Place the end of the conductor on the floor parallel to a straight edge line and carefully release the end. (e.g. – A straight edge line may constitute a nearby level wall or a painted line along the floor.)
- c) Use a tape measure or equivalent to measure the maximum distance that the conductor sample deviates from the referenced straight edge. The conductor should not retract more than 10% of its total length (e.g. if sample is 30 ft. long, it should not retract more than 3 ft.).

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- d) Visually inspect the sample for elevation or vertical displacement. The conductor shall lay flat with no vertical displacement. If sample conductor shows signs of elevation or vertical displacement, corrective action shall be taken.
- e) The results of these tests are the distance in inches that the cable deviates from the straight edge and also the vertical elevation in inches from floor.
 - 1) Deviations of three or more feet from a straight line are considered to be failing.
 - 2) “Spiraling” or “cork screwing” that is elevated more than ten inches off of the floor is considered failing.
 - 3) Unraveling of strands when the cable is cut or tendency for a given strand to protrude further than others is a good indication that tension is not uniform across all conductor strands.
 - 4) Reels that have been spring back tested must have a tag that indicates this in addition to the aforementioned identification requirements.

2.3.5. Standard Conductor Sizes

Conductor supplied under this category shall be sized per the table below:

Code Name	ACSR Equiv. Size (AWG)	Stranding	Approx. Weight (lbs/1000')	Breaking Strength (lbs)	Division ID
Azusa	1/0	7	115.0	4,280	78838

2.3.6. Packaging

Conductor shall be packaged in accordance with Section 2.1.3 and the table below:

Code Name	Size (AWG)	Approx. Feet Per Reel	Max. Flange Diameter (in.)	Max Overall Reel Width (in.)	Division ID
Azusa	1/0	6,000	34	33	78838

2.4. Aluminum-Coated Steel-Reinforced (ACSR) Conductor

2.4.1. Purpose

This conductor is used as bare overhead transmission conductor. ACSR offers optimal strength for line design.

2.4.2. Product Description

Conductor shall be bare aluminum 1350-H19 wires, concentrically stranded about a steel core. Steel core shall be class A galvanized.

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2.4.3. Applicable Codes and Standards

The conductor in this specification shall meet and/or exceed all requirements of the latest editions of the standards listed below. The conductor shall further meet and/or exceed those applicable standards not stated herein but referenced by the below standards.

- a) ASTM B230 – Standard Specification for Aluminum Conductors, 1350-H19 for Electrical Purposes
- b) ASTM B231 – Standard Specification for Aluminum Conductors, Concentric-Lay-Stranded 1350 Conductors
- c) ASTM B232 – Standard Specification for Concentric-Lay-Stranded Aluminum Conductors, Coated-Steel Reinforced (ACSR)
- d) ASTM B498 – Standard Specification for Zinc-Coated (Galvanized) Steel Core Wire for Use in Overhead Electrical Conductors
- e) ASTM B500 – Standard Specification for Metallic Coated or Aluminum Clad Stranded Steel Core for Use in Overhead Electrical Conductors

2.4.4. Standard Conductor Sizes

Conductor supplied under this category shall be sized per the table below:

Code Name	Size (kcmil)	Stranding	Approx. Weight (lbs/1000')	Breaking Strength (lbs)	Division ID
Drake	795	26/7	1,093	31,500	19981

2.4.5. Packaging

Conductor shall be packaged in accordance with Section 2.1.3 and the table below:

Code Name	Size (kcmil)	Approx. Feet Per Reel	Max. Flange Diameter (in.)	Max Overall Reel Width (in.)	Division ID
Drake	795	3,500	60	34	19981

2.5. Aluminum Tie Wire

2.5.1. Purpose

This wire is used in overhead transmission and distributions line construction to mechanically secure components to pin insulators.

2.5.2. Product Description

This wire shall be a solid, soft drawn, uncoated 1350-O aluminum.

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2.5.3. Applicable Codes and Standards

The wire in this specification shall meet and/or exceed all requirements of the latest edition of ASTM B609 – Standard Specification for Aluminum 1350 Round Wire, Annealed and Intermediate Tempers, for Electrical Purposes. The wire shall further meet and/or exceed those applicable standards not stated herein but referenced this standard.

2.5.4. Standard Wire Sizes

Wire supplied under this category shall be sized per the table below:

Size (AWG)	Stranding	Approx. Weight (lbs/1000')	Division ID
6	Solid	24.1	20081
4	Solid	38.4	78864

2.5.5. Packaging

Wire shall be packaged in the manufacturer’s standard packaging with a maximum weight of 25 lbs. per package.

2.6. **Type M Guy Wire – Aluminum-Clad Steel**

2.6.1. Purpose

This wire is used in any of the usual dead-ending methods of overhead electric distribution and transmission line construction.

2.6.2. Product Description

The guy strand wire shall be a high tensile strength, light-weight strand protected by a thick cladding of aluminum with a minimum cladding thickness of ten percent (10%) of the wire radius. The aluminum cladding and the steel core shall be joined by a continuous ductile weld, which eliminates cracking or separation of the protective aluminum from the steel core.

2.6.3. Applicable Codes and Standards

The wire in this specification shall meet and/or exceed all requirements of the latest edition of ASTM B416 – Standard Specification for Concentric-Lay-Stranded Aluminum-Clad Steel Conductors. The wire shall further meet and/or exceed those applicable standards not stated herein but referenced this standard.

2.6.4. Standard Wire Sizes

Alumoweld® Designation	Stranded Dia. (in.)	Strands	Approx. Weight (lbs/1000')	Breaking Strength (lbs)	Division ID
16M	0.386	7	262	16,000	19987

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For Overhead Distribution Applications, 15 kV Max.
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2.6.5. Packaging

Wire shall be packaged in 250-foot coils and labeled in accordance with Section 2.1.1.