

TECHNICAL SPECIFICATIONS**MEDIUM VOLTAGE TRXLP JACKETED POWER CABLE****1. SCOPE**

To furnish complete, factory pre-assembled cable, designed for installation on a grounded wye system having distribution primary voltages of 2400/4160, 7620/13,200, and 15,240/26,400 volts. This cable shall be suitable for underground, or interior power circuits in either wet or dry applications, and is used for primary leads, primary distribution in power plants and URD and network feeder applications, transformer and generator leads, apparatus connections and vertical risers where high reliability and long life are desired, and where higher temperatures may be encountered.

Multi-conductor TRXLPE cables shall consist of three individual strand filled conductors, each with true triple extruded semiconducting strand shield, insulation and semiconducting insulation shield. The three single cables shall be parallel wound into one three conductor cable. Single-conductor TRXLPE cables shall consist of an individual strand filled conductor, with true triple extruded semiconducting strand shield, insulation and semiconducting insulation shield.

2. APPLICABLE STANDARDS

All cable shall meet or exceed the latest edition of the following industry standards except where specifically noted:

AEIC CS8-07	Specification for Extruded Dielectric Shielded Power Cables Rated 5 through 46 kV
ANSI/ICEA S-94-649	Standard for Concentric Neutral Cables Rated 5,000 – 46,000 Volts
ANSI/ICEA S-97-682	Standard for Utility Shielded Power Cables Rated 5,000 – 46,000 Volts
ICEA T-25-425	Guide for establishing stability of resistivity for conducting polymeric components of power cables.
ASTM B-3	Copper wire, soft or annealed.
ASTM B-8	Copper conductors, concentric lay stranded, hard, medium hard, or soft.
ICEA T-32-645	Guide for Establishing Compatibility of Sealed Conductor Filler Compound with Conducting Stress Control Material.
ASTM B-230	Aluminum Wire, EC-H19 for Electrical Purposes.
ASTM B-231	Aluminum conductors Concentric Lay Stranded.
ASTM B-609	Aluminum Wire, Annealed and Intermediate tempers for Electrical Purposes.
NEMA WC 26	Wire and Cable Packaging

Where a particular product requirement or characteristic is specified in more than one document, the most stringent shall apply.

3. DESIGNATIONS

- 3.1. The maximum continuous operating temperature of conductor, at rated load, shall be limited to 90°C, the emergency operating temperature shall not exceed 130°C, and the short circuit operating temperature shall not exceed 250°C as per the latest revision of AEIC .

4. CONSTRUCTION

4.1. CONDUCTOR

- 4.1.1. Aluminum conductor shall be $\frac{3}{4}$ hard drawn or full hard drawn, class B, stranded 1350 conductor. If compressed conductor is used, it shall not be compressed more than 3% of its original diameter as per ICEA . Compressed conductors shall be used for all cables except Item ID CAI CL 013 (750 cu), which shall be compact.
- 4.1.2. Concentric - a conventional concentric stranded conductor, in accordance with ASTM specifications, is to be furnished all conductor. Solid copper concentric neutral wires shall be spirally applied and the entire assembly covered with a LLDPE jacket.
- 4.1.3. Strand filling - in order to alleviate water (electrochemical) treeing in the insulation, strand filling compound will completely fill the conductor's inner strand layer(s). This compound shall be flexible and stable under the conditions imposed by the cable's operation within limits stipulated herein, and compatible with the conductor, strand shield and insulation materials per ICEA Publication T-32-645. The outer strand surface of the conductor shall be clean from the filling compound so that splices and terminations can be applied using standard compression type connectors employing the same techniques as for unfilled conductors.
- 4.1.4. Copper conductors are to be composed of untinned soft or annealed concentric copper wires and conforming to reduced diameter compressed formation meeting, before stranding, physical requirements of ASTM specifications.

4.2. CONDUCTOR SHIELDING

This cable shall have an extruded super smooth semiconducting shield (HFDA-0800 or HFDA-0802 or LE-0504 or LE-0500) applied directly on the conductor for stress relief and better adhesion of the insulation, and be compatible with the insulation material. LE-0594 or LE-0595 is also allowed. HFDA 0802, LE 0504 and LE 0594 are only allowed for use with aluminum conductors.

4.3. INSULATION

- 4.3.1. The insulation thickness shall meet or exceed 100% of the recommended voltage rated insulation.
- 4.3.2. The cable shall consist of extruded unfilled tree retardant cross linked thermosetting polyethylene insulation (HFDB-4202 or LE-4212) directly over the conductor shield. The extrusion shall be smooth, free from voids and imperfections, and have uniform thickness with the conductor well centered.
- 4.3.3. The insulation diameter shall be in accordance with ICEA for CAI CL001 and CAI CL002. The insulation diameter shall be in accordance with AEIC CS8-07 on all other cables cover by this specification.

4.4. INSULATION SHIELDING

Extruded semiconducting shield (HFDA-0693 or LE-0310) shall be used between the insulation and the outer jacket to relieve stress.

The insulation shield diameter shall be in accordance with ICEA for CAI CL001 and CAI CL002. The insulation shield diameter shall be in accordance with AEIC CS8-07 on all other cables cover by this specification.

4.5. JACKET

- 4.5.1. For corrosion protection in duct installations as well as in other types of installation, the cable shall be jacketed with a Linear Low Density Polyethylene Compound. The jacket shall be extruded to encapsulate the concentric neutral wires filling the interstice area leaving no voids and shall be free stripping. The JEA item ID CAICL011 (1000 MCM) requires a modified overlaying jacket see section 10.
- 4.5.2. This jacket is to be applied without contamination or oil between the jacket and cable, and shall be suitable for exposure to direct sunlight.
- 4.5.3. A water swellable powder or tape shall be applied between the insulation shield and the jacket to block the ingress of moisture into and along the interface and around the concentric wires of the cable.
- 4.5.4. The jacket thickness shall be in accordance with the applicable section of ICEA .

5. CABLE ASSEMBLY

Polyethylene insulation and semiconducting compounds shall be maintained in an extra clean, closed system from their manufacture to the cable extruder. The cable shall be true triple extruded and dry cured. The cable shall be assembled in lengths specified in section 10.

6. DIMENSIONS AND DATA

Approved manufacturers for each bid item shall be notified and required to submit approval drawings and documentation that includes the cross sectional drawing of the cable and dimensions including: Outside diameter, diameter over conductor shield, diameter over insulation, and diameter over insulation shield. The dimensions provided must be given with plus and minus tolerances and conform to ICEA and AEIC geometry and dimensional tolerances. Ampacities, impedance values, and cable weight per thousand feet (lbs/1000ft) shall also be included. In addition, the manufacturer and designation of the insulation and semi-conductive compounds used in the production of the cable shall be provided on each drawing. At the time of notification, all required drawings/documentation must be received within the specified time period and approved by JEA Standards for specification conformance.

7. IDENTIFICATION

- 7.1. The cable shall have permanent contrasting marking (indented or hot foil tape) on the jacket at interval not to exceed five feet. The marking on each cable jacket shall contain the manufacturer's name, plant designation, conductor size and type, insulation and wall thickness, voltage rating and year of manufacture. Sequential footage markings shall be applied at a maximum of every three feet on all single conductor cables and on phase A or phase 1 of all three conductor cables.
- 7.2. Markings shall meet the requirements of AEIC.
- 7.3. Multi-conductor or parallel cables shall have permanent contrasting phase identification (indented preferred) applied to the outer jacket of each conductor at a maximum of twenty four inch intervals. Phase marking may be either 1, 2, 3, or A, B, C.

8. SHIPPING

- 8.1. Each reel shall be shipped complete with protective cover and identification marking for storage. Non-returnable wood reels shall meet the requirements of NEMA WC-26, Class II (Note: Arbor holes minimum diameter allowed 3-1/4"). The reels must be able to withstand shipping, handling, and storage for at least one year without decomposition. JEA approved water proof insulated End Caps shall be installed on each cable end. (See the JEA Master Material Catalog Items THEHS002, THEHS003 & THEHS004). Reel sizes indicated are maximum (outside to outside dimensions).
- 8.2. Any material shipped to JEA and deemed unacceptable shall be returned to the manufacturer at his expense.
- 8.3. A metal tag permanently attached to the side of the reel shall depict beginning and ending footage markings. This information shall be stamp punched or permanently marked, with indelible ink, on the tag. A metal tag is not required if the beginning and ending footage markings are "legibly and permanently written with black indelible ink on the wood flange (within 12 inches of the outside edge) and included on the manufacturer's standard reel tag".
- 8.4. Cable shall be supplied on the following maximum reel sizes and reel lengths: Reel length tolerance is -0% +10%.

JEA	Conductor			Min. Reel	Max
<u>Item ID</u>	<u>Size</u>	<u>Type</u>	<u>KV</u>	<u>Length</u>	<u>Size</u>
CAI CL 001	1/0	AL	28	5000'	NR 72x48
CAI CL 002	1/0	AL	28	1500'	NR 72x48
CAI CL 004	#8	CU	5	1000'	NR72x36
CAI CL 005	350	AL	28	1000'	NR72x36
CAI CL 008	400	CU	28	1000'	NR 72x36
CAI CL 009	400	CU	15	1000'	NR 72x36
CAI CL 010	750	AL	35	1000'	NR 72x48
CAI CL 011	1000	AL	28	1000'	NR 72x36
CAI CL 012	750	AL	5	2000'	NR 72x36
CAI CL 013	750	CU	15	1000'	NR 72x36
CAI CL 015	350	CU	28	1000'	NR 72x36
CAI CL 020	1/0	CU	28	1500'	NR 72x48
CAI CL 040	4/0	CU	28	1000'	NR 72x48

9. TESTING

- 9.1. JEA reserves the right to subject cable to test by a recognized laboratory.
- 9.2. Each length of completed cable shall be tested, electrically and physically, in accordance with ICEA.
- 9.3. Certified test reports shall be furnished on all cables shipped. The report shall include the master reel numbers, JEA item ID, purchase order number, shipping reel number(s) and the actual test results compared to the required values. The conductor shield, insulation and insulation shield compound designation shall also be included in the certified test report.
- 9.4. The results of all tests shall be mailed to the address below within 30 days of shipment:

JEA UG Distribution Standards
 21 West Church St., Tower 5th Floor
 Jacksonville, Florida 32202

- 9.5. Each length of cable shall be tested in accordance with AEIC specifications. ICEA T-34-664 "Guide For Conducting Longitudinal Water Penetration Resistance Tests On Longitudinal Water Blocked Cables" shall be used to test the entire cable cross section at 10 PSIG for embedded jacket cables and 5 PSIG for modified overlaying jacket cables. Water block test is not required on tape shielded cable designs.

10. JEA SPECIFIC REQUIREMENTS

JEA	Conductor					# of	# of	Nom.		Type	Reel
<u>Item ID</u>	<u>Size</u>	<u>Type</u>	<u>KV</u>	<u>Concentric</u>	<u>Jacket</u>	<u>Cond.</u>	<u>Strands</u>	<u>O. D.</u>	<u>Amp</u>	<u>Neutral</u>	<u>Length</u>
CAI CL 001	1/0	AL	28	16-14 AWG	LLDPE	1	19	1.300"	180	Full	5000'
CAI CL 002	1/0	AL	28	6-14 AWG	LLDPE	3	19	1.300"	180	1/3 ea	1500'
										conductor	
CAI CL 004	#8	CU	5	6#22 Cu	LLDPE	1	7	.640"		Full	1000'
CAI CL 005	350	AL	28	18-14 AWG	LLDPE	1	37	1.705"	337	1/3	1000'
CAI CL 008*	400	CU	28	2-4 mil Cu	LLDPE	1	61	1.635"	450	1/25	1000'
	* non-strand filled conductor			tape, 1/2 lap reverse wound							
CAI CL 009	400	CU	15	2-4 mil Cu	LLDPE	1	37	1.415"	450	1/25	1000'
				tape, 1/2 lap reverse wound							
CAI CL 010	750	AL	35	15 #10	LLDPE	1	61	2.265"	525	1/3	1000'
CAI CL 011	1000	AL	28	18 #14	LLDPE	1	61	2.275"	600	1/9	1000'
				(OVERLAYING)							
CAI CL 012	750	AL	5	24#12 Cu	LLDPE	1	61	1.505"	525	1/3	2000'
CAI CL 015	350	CU	28	18-14 AWG	LLDPE	1	37	1.705"	410	1/3	1000'
CAI CL020	1/0	CU	28	9 # 14	LLDPE	3	19	1.300"	215	1/3	1500'
CAI CL040	4/0	CU	28	11 # 12	LLDPE	3	19	1.500"	320	1/3	1000'
								Max. O.D.			
CAI CL 013	750	CU	15	see below	LLDPE	1	61	1.63"	625	1/4	1000'
				18-0.199" X .041" strips (based upon 25 KA fault current for .223 seconds)							

Note: Reel lengths shown are minimum allowed lengths. (See section 8.4 for details).

11. APPROVED MANUFACTURERS

List of approved manufactures can be seen in the latest copy of the Master Material Catalog. However, the approved manufacturers still must have their drawings pre-approved before providing a quotation as stated in section 12.

12. SUBMITTAL REQUIREMENTS

THE FOLLOWING INFORMATION MUST BE PROVIDED BY THE RESPONDENT WHO RANKS FIRST AFTER THE BAFO SUBMITTAL, AND BE APPROVED BY THE STANDARDS ENGINEER BEFORE A MANUFACTURER CAN BE DEEMED THE AWARDEE OF THE CONTRACT (DOES NOT APPLY TO SPOT BUYS):

- 12.1. Manufacturer must submit one copy of the dimensions and data drawings, showing all required information as stated in this specification for each item, specifically listing the item ID.
- 12.2. Approved manufacturer drawings shall be marked approved and signed by the standards engineers and then a copy returned to the manufacturer.

THE FOLLOWING INFORMATION MUST BE FINALIZED PRIOR TO SHIPMENT OF MATERIAL:

- 12.3. Drawings sent prior to quotation must be re-submitted prior to shipment of any items to insure there have been no material or design changes. If changes are required they must be noted by the manufacturer and approved by the appropriate JEA standards engineer.

SECTION XI – TECHNICAL SPECIFICATIONS – CONTROL CABLE

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1. DESCRIPTION

This Specification covers single and multiple conductor control cable to be used in control houses, generating stations, and substations where a multiple conductor cable of maximum service reliability is required for remote control of motors, circuit breakers and miscellaneous power equipment, relays, switches, light systems, and similar types of automatic or control circuits. Cable shall be suitable for 0-600 Volt AC or DC operations, for installation in wet or dry locations, in conduits or ducts, direct buried and as open wiring indoors, and for continuous operation at conductor temperature up to 75°C.

2. SPECIFICATIONS

Cable shall meet or exceed all applicable requirements of the latest edition of ICEA - NEMA Standards for thermoplastic insulated wire and cable.

3. CONDUCTOR

The conductors shall consist of soft or annealed, stranded, uncoated copper, unless otherwise specified, meeting the requirements of ASTM B-3, ASTM B-8, and ICEA - NEMA Standard S-61-402. If coating is required it shall conform to ASTM B-33 or ASTM B-189, for tin or lead-tin alloy. The stranding shall be Class B meeting the requirements of ASTM B-8.

4. INSULATION

4.1 Each individual conductor shall be insulated with a free stripping, 20 mil thick of clear or natural high molecular weight polyethylene, meeting the requirements of ICEA S-61-402, NEMA WC-5, Part 3.

4.2 A nominal 10 mil jacket of color coded polyvinyl chloride shall be extruded tightly over the insulation.

5. ASSEMBLY

The required number of conductors shall be assembled into a round cable with a suitable length of lay, the direction of lay alternating for each layer with the outer layer in a left hand direction. Fillers shall be used only when necessary to assure a round cross section. The assembly shall comply with the requirements of ICEA S-61-402, NEMA WC-5, Part 5, Paragraph 5.2. A suitable binder tape shall be helically applied over the assembly.

6. SHIELDING

Whenever shielded cable is supplied, the shielding shall be a corrugated 5 mil nominal copper tape longitudinally applied. At least one (1) #16 AWG or larger copper drain wire shall be included in each cable on the inside of the copper shielding tape and remain in electrical contact with the copper shield tape.

7. COLOR CODING

The jacket over the individual conductors shall be permanently color coded according to NEMA Publication WC 30, Method 1, Table K-1. The jacket over the individual conductors shall be permanently color coded according to the following table. **Tracer stripes shall be continuous and spirally wound.**

CONDUCTOR NUMBER	BACKGROUND OR BASE COLOR	TRACER COLOR
1	Black	-
2	White	-
3	Red	-
4	Green	-
5	Orange	-
6	Blue	-
7	White	Black
8	Red	Black
9	Green	Black
10	Orange	Black
11	Blue	Black
12	Black	White
13	Red	White
14	Green	White
15	Blue	White
16	Black	Red
17	White	Red
18	Orange	Red
19	Blue	Red
20	Red	Green
21	Orange	Green

8. OUTER COVERING

- 8.1 A jacket of polyvinyl chloride shall be extruded over the taped assembly to protect the insulation. The jacket shall meet the requirements of ICEA S-61-402, Part 4, and be sufficiently flexible for installation in cold weather.
- 8.2 Cable identification shall be surface printing applied to the outer jacket at a maximum of 24" intervals and shall include the manufacturer's name or trademark, type of cable, number and size of conductors, and rated voltage.
- 8.3 Cable sheathing shall also include a length marking which can be readily used to determine the length of the cable to within two (2) foot increments which remains on a spool or is installed in a specific run. In the event that the marking is a serial marking on the sheath which does not start from zero, the manufacturer shall note the starting and ending numbers on both the reel tag and on the reel itself.

9. REELS

Cable shall be shipped on non-returnable wooden reels marked with the cable identification, the JEA P.O. #, the total footages, and the starting and ending numbers of the cable, as discussed above. The cable shall be shipped with lengths of 5000', except in the case of the 21 conductor cable, which shall be shipped on reels of 2,500'. Reels shall be allowed with these lengths +/- 10%. Reels shall be built in accordance with NEMA WC-26. Minimum arbor diameter shall be 3".

10. QUALIFICATIONS

JEA ITEM ID #	CONDUCTOR SIZE	# CONDUCTORS	SHIELDED/ UNSHIELDED	REEL SIZE
CAI CN 001	#10 STR/B	2	UNSHIELDED	NRC 32.24
(NONE)	#10 STR/B	2	SHIELDED	NRC 32.24
CAI CN 002	#10 STR/B	4	UNSHIELDED	NRC 32.24
CAI CN 004	#10 STR/B	8	UNSHIELDED	NRC 40.24
CAI CN 008	#14 STR/B	7	UNSHIELDED	NRC 32.24
CAI CN 009	#10 STR/B	21	UNSHIELDED	NRC 58.24
CAI CN 010	#14 STR/B	4	UNSHIELDED	NRC 32.24
CAI CN 015	#12 STR	1	UNSHIELDED	500FT/BOX
CAI CN 016	#10 STR/B	4	SHIELDED	NRC 32.24
CAI CN 017	#10 STR/B	8	SHIELDED	NRC 40.24
CAI CN 018	#10 STR/B	21	SHIELDED	NRC 58.24

11. CABLE SAMPLES

Upon request, the Contractor shall provide cable samples of each type specified. Cable samples shall be of similar construction to that proposed by the manufacturer for subsequent delivery to JEA.

12. APPROVED MANUFACTURERS

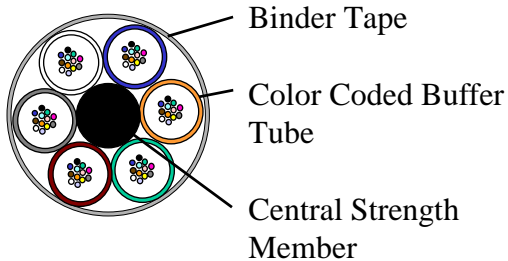
See current Oracle listing for approved manufacturers.

PO Box 3127
Spartanburg, SC 29304
Tel: 1 800 235 3423
Fax: 1 864 433 5560

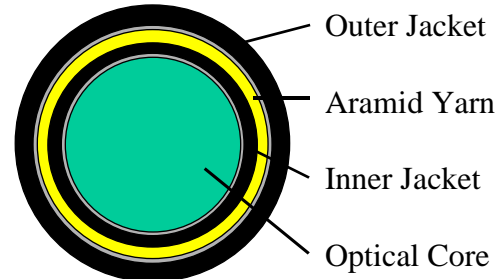
Specification DNA-32377

AFL-ADSS Fiber Optic Cable

Representative 6 unit Fiber Optic Core



Representative AFL-ADSS® Fiber Optic Cable



AE144ATO621E08

144 Corning® SMF-28 Ultra Singlemode

Sag / Tension Performance

Span Length (ft)		600								
Condition	Wind (mi/hr)	Radial Ice (inches)	Add'l Load (lbs/ft)	Input Data			Resultant Data			
				Vert. (ft)	Horiz. (ft)	Vector (ft)	Vert. (ft)	Horiz (ft)	Vector (ft)	Tension (lbs)
Installation	---	---	---	6.0	---	---	6.00	---	6.0	1,248
Ice Alone	---	---	---	---	---	---	---	---	---	---
Wind Alone	---	---	---	---	---	---	---	---	---	---
Ice and Wind	---	---	---	---	---	---	---	---	---	---
NESC Light	60.0	---	0.1	---	---	---	5.28	16.9	17.7	1,544
Other	---	---	---	---	---	---	---	---	---	---

Standards

Designed and Manufactured in accordance with the following:

Cable	IEEE 1222
Fiber	IEC 60793, ITU-T G.65x Series
Color Code	ANSI/EIA 359-A, 598-A, IEC 60304

Specification DNA-32377

Mechanical / Physical Details

Approximate Cable Diameter		17.7 mm	0.695 in
Approximate Cable Weight		248 kg/km	0.166 lbs/ft
Maximum Rated Cable Load (MRCL)		710 kg	1,566 lbs
Approximate Cable Breaking Strength		1,459 kg	3,217 lbs
Minimum Bending Radius	Static	18 cm	7 in
	Dynamic	36 cm	14 in
Coefficient of Linear Expansion		3.11E-05 1/°C	1.73E-05 1/°F
Cable Modulus	Initial	2.59 kN/mm²	375.3 kpsi
	Final	2.79 kN/mm²	404.7 kpsi
	10 Year	2.16 kN/mm²	312.7 kpsi
Environmental Temperature Recommendations			
	Storage	-50 to +70 °C	-58 to +158 °F
	Operation	-40 to +70 °C	-40 to +158 °F
	Installation	-30 to +70 °C	-22 to +158 °F

Optical Details

Attenuation Characteristics for Corning® SMF-28 Ultra Singlemode fibers

Max Individual

0.35 dB/km 1310 nm
0.25 dB/km 1550 nm

144 Fiber ADSS Core (6 - 24 fiber buffer tubes)

Unit	Fiber Type	Fiber Count
Blue	Corning® SMF-28 Ultra Singlemode fibers	24
Orange	Corning® SMF-28 Ultra Singlemode fibers	24
Green	Corning® SMF-28 Ultra Singlemode fibers	24
Brown	Corning® SMF-28 Ultra Singlemode fibers	24
Slate	Corning® SMF-28 Ultra Singlemode fibers	24
White	Corning® SMF-28 Ultra Singlemode fibers	24
Total Fiber Count		144

Standard Fiber Color Code

Fiber No.	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Rose	Aqua

- 1) Designs with more than 12 fibers per tube will use the standard color code and binders for identification of the fibers.
- 2) Designs with mixed fiber types will have multimode or NZDS fibers in the first tube(s) followed by single-mode fibers in the last tube(s).

Installation and Handling Recommendations

Installation and cable preparation procedures are outlined in the AFL documents listed below. Contact AFL to request copies.

Recommended Installation Procedures for All-Dielectric, Self-Supporting (ADSS) Fiber Optic Cable

AFL-ADSS® Fiber Optic Cable Installation Video

Installation Instructions for Installing All-Dielectric, Self-Supporting (ADSS) in an AFL Telecommunications Splice Enclosure

Fiber Optic Cable Receiving, Handling and Storage. Document ACS-WI-809

Specification DNA-32377

Quick Reference Installation Notes

Approximate Cable Diameter	17.65 mm	0.695 in
Maximum Stringing Tension (at tensioner)*	292 kg	643 lbs
Minimum Bull Wheel Diameter	124 cm	49 in
Stringing Sheave Diameter**	71 cm	28 in
Minimum Bending Radius		
Cable		
Static (No load)	18 cm	7 in
Dynamic (under tension)	36 cm	14 in
Fiber		
After Installation (Static)	3.8 cm	1.5 in
Plastic Buffer Tube		
After Installation (Static)	8 cm	3 in

* - The stringing tension is always measured at the tensioner side. In general the maximum stringing tension should be a half of the maximum sagging tension and never should exceed 20% RBS of the ADSS Cable.

** - The value indicated is for the first and last structures of the pull and is based on 40 times the diameter of the ADSS cable. Smaller diameters can be used at tangent structures. Reference AFL's installation instructions for more details.

Reference AFL's "Recommended Installation Procedures for All-Dielectric, Self-Supporting (ADSS) Fiber Optic Cable" for detailed installation instructions.

Shipping Reels

Reel Type	FL	TR	DR	OW	Tare (kgs)	FL	TR	DR	OW	Tare (lbs)	Capacity	
	(cm)					(in)					(meters)	(feet)
Wood	147	81	71	97	200	58	32	28	38	441	3,060	10,030
Wood	168	91	91	107	260	66	36	36	42	573	4,110	13,480
Wood	183	91	91	107	300	72	36	36	42	662	5,410	17,740
Wood	213	86	89	104	385	84	34	35	41	849	7,000	22,960
Steel	152	81	81	97	156	60	32	32	38	344	3,020	9,900
Steel	183	91	102	107	245	72	36	40	42	540	4,880	16,010
Steel	213	114	107	130	351	84	45	42	51	774	7,000	22,960

FL - Flange Diameter; TR - Inside Traverse Width; DR - Drum Diameter; OW - Outside Overall Width
Arbor Hole Diameter: Wood: 3-1/8in (7.9cm)
Steel: 3in (7.6cm)

Maximum lengths shown are the longest lengths that AFL offers. Longer lengths may be possible.

Ordered lengths should include a distribution of lengths, i.e., all reels cannot be ordered at the maximum.

A typical reel length distribution is as follows:

6000m – 7000m ~ 15% of reels
4500m – 6000m ~ 55% of reels
2500m – 4500m ~ 25% of reels
<2500m ~ 5% of reels

Wood reels with flex-wrap covering are standard. Non-returnable steel reels and/or wood lagging are available upon request. Additional reel sizes may be available upon request.

Steel reels are recommended for long term storage. Reference AFL's "Fiber Optic Cable Receiving, Handling and Storage" document for additional information.

Specification DNA-32377

The Screen Inputs for ADSS cables in PLS Cad

Cable Data			
Name:			
Description:	AFL ADSS DNA-32377 AE144ATO621E08		
Cross section area (in ²)	0.3792	Unit weight (lbs/ft)	0.166
Outside diameter (in)	0.695	Ultimate Tension (lbs)	3,217
Temperature at which data below were obtained		(deg F)	70

Outer strands	Final modulus of elasticity (psi/100)	4,047
	Thermal expansion coeff. (/100 deg F)	1.73E-03

Generate Coefficients

Polynomial coefficients (all strain in %)					
	A0	A1 (psi/100)	A2	A3	A4
Stress-strain		3,753			
Creep		3,127			

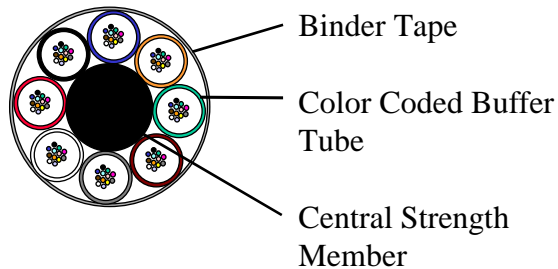
Core strands	Final modulus of elasticity (psi/100)				
(if different from	Thermal expansion coeff. (/100 deg F)				
outer strands)					
	Polynomial coefficients (all strain in %)				
	A0	A1 (psi/100)	A2	A3	A4
Stress-strain					
Creep					

Specification DNA-31429

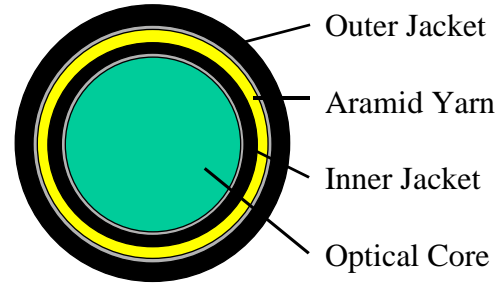
Tracking Resistant ADSS Cable

AC048AJ6821BD0

Representative 8 unit Fiber Optic Core



Representative AFL-ADSS® Fiber Optic Cable



Sag / Tension Performance

Span Length (ft) 1,000											
Condition	Input Data			Resultant Data							
	Wind (mi/hr)	Radial Ice (inches)	Add'l Load (lbs/ft)	Vert. (ft)	Horiz. (ft)	Vector (ft)	Vert. (ft)	Horiz (ft)	Vector (ft)	Tension (lbs)	
Installation	---	---	---	10.0	---	---	10.00	---	10.0	1,609	
Installation	---	---	---	10.0	---	---	10.00	---	10.0	1,609	
Ice Alone	---	---	---	---	---	---	---	---	---	---	
Ice Alone	---	---	---	---	---	---	---	---	---	---	
Wind Alone	93.0	---	---	---	---	---	4.66	39.7	40.0	3,454	
Wind Alone	93.0	---	---	---	---	---	4.66	39.7	40.0	3,454	
Ice and Wind	---	---	---	---	---	---	---	---	---	---	
Ice and Wind	---	---	---	---	---	---	---	---	---	---	
NESC Light	60.0	---	0.1	---	---	---	7.40	26.3	27.3	2,403	
NESC Light	60.0	---	0.1	---	---	---	7.40	26.3	27.3	2,403	
Other	---	---	---	---	---	---	---	---	---	---	
Other	---	---	---	---	---	---	---	---	---	---	

Standards

Designed and Manufactured in accordance with the following:

Cable	IEEE 1222
Fiber	IEC 60793, ITU-T G.65x Series
Color Code	ANSI/EIA 359-A, 598-A, IEC 60304

Specification DNA-31429

Mechanical / Physical Details

Approximate Cable Diameter		15.1 mm	0.594 in
Approximate Cable Weight		192 kg/km	0.129 lbs/ft
Maximum Rated Cable Load (MRCL)		2,299 kg	5,069 lbs
Approximate Cable Breaking Strength		3,677 kg	8,106 lbs
Minimum Bending Radius	Static	16 cm	6 in
	Dynamic	31 cm	12 in
Coefficient of Linear Expansion		6.95E-06 1/°C	3.86E-06 1/°F
Cable Modulus	Initial	11.45 kN/mm²	1,660.2 kpsi
	Final	12.34 kN/mm²	1,790.4 kpsi
	10 Year	9.54 kN/mm²	1,383.5 kpsi
Environmental Temperature Recommendations			
	Storage	-50 to +70 °C	-58 to +158 °F
	Operation	-40 to +70 °C	-40 to +158 °F
	Installation	-30 to +70 °C	-22 to +158 °F

Optical Details

Attenuation Characteristics for Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers

Max Individual

0.35 dB/km 1310 nm
0.25 dB/km 1550 nm

48 Fiber ADSS Core (8 - 6 fiber buffer tubes)

Unit	Fiber Type	Fiber Count
Blue	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Orange	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Green	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Brown	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Slate	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
White	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Red	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Black	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Total Fiber Count		48

Standard Fiber Color Code

Fiber No.	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Rose	Aqua

- 1) Designs with more than 12 fibers per tube will use the standard color code and binders for identification of the fibers.
- 2) Designs with mixed fiber types will have multimode or NZDS fibers in the first tube(s) followed by single-mode fibers in the last tube(s).

Installation and Handling Recommendations

Installation and cable preparation procedures are outlined in the AFL documents listed below. Contact AFL to request copies.

Recommended Installation Procedures for All-Dielectric, Self-Supporting (ADSS) Fiber Optic Cable

AFL-ADSS® Fiber Optic Cable Installation Video

Specification DNA-31429

Installation Instructions for Installing All-Dielectric, Self-Supporting (ADSS) in an AFL Telecommunications Splice Enclosure

Fiber Optic Cable Receiving, Handling and Storage. Document ACS-WI-809

Specification DNA-31429

Quick Reference Installation Notes

Approximate Cable Diameter	15.10 mm	0.594 in
Maximum Stringing Tension (at tensioner)*	735 kg	1,621 lbs
Minimum Bull Wheel Diameter	106 cm	42 in
Stringing Sheave Diameter**	61 cm	24 in
Minimum Bending Radius		
Cable		
Static (No load)	16 cm	6 in
Dynamic (under tension)	31 cm	12 in
Fiber		
After Installation (Static)	3.8 cm	1.5 in
Plastic Buffer Tube		
After Installation (Static)	8 cm	3 in

* - The stringing tension is always measured at the tensioner side. In general the maximum stringing tension should be a half of the maximum sagging tension and never should exceed 20% RBS of the ADSS Cable.

** - The value indicated is for the first and last structures of the pull and is based on 40 times the diameter of the ADSS cable. Smaller diameters can be used at tangent structures. Reference AFL's installation instructions for more details.

Reference AFL's "Recommended Installation Procedures for All-Dielectric, Self-Supporting (ADSS) Fiber Optic Cable" for detailed installation instructions.

Shipping Reels

Reel Type	FL	TR	DR	OW	Tare (kgs)	FL	TR	DR	OW	Tare (lbs)	Capacity (meters)	Capacity (feet)
		(cm)					(in)					
Wood	147	81	71	97	200	58	32	28	38	441	3,850	12,630
Wood	168	91	91	107	260	66	36	36	42	573	5,170	16,960
Wood	183	91	91	107	300	72	36	36	42	662	6,760	22,170
Wood	213	86	89	104	385	84	34	35	41	849	7,000	22,960
Steel	152	81	81	97	345	60	32	32	38	761	3,810	12,490
Steel	183	91	102	107	540	72	36	40	42	1,191	6,140	20,140
Steel	213	114	107	130	773	84	45	42	51	1,704	7,000	22,960

FL - Flange Diameter; TR - Inside Traverse Width; DR - Drum Diameter; OW - Outside Overall Width
Arbor Hole Diameter: Wood: 3-1/8in (7.9cm)
Steel: 3in (7.6cm)

Maximum lengths shown are the longest lengths that AFL offers. Longer lengths may be possible.

Ordered lengths should include a distribution of lengths, i.e., all reels cannot be ordered at the maximum.

A typical reel length distribution is as follows:

6000m – 7000m ~ 15% of reels
4500m – 6000m ~ 55% of reels
2500m – 4500m ~ 25% of reels
<2500m ~ 5% of reels

Wood reels with flex-wrap covering are standard. Non-returnable steel reels and/or wood lagging are available upon request. Additional reel sizes may be available upon request.

Steel reels are recommended for long term storage. Reference AFL's "Fiber Optic Cable Receiving, Handling and Storage" document for additional information.

Specification DNA-31429

The Screen Inputs for ADSS cables in PLS Cad

Cable Data			
Name:			
Description:	AFL ADSS DNA-31429 AC048AJ6821BD0		
Cross section area (in ²)	0.2776	Unit weight (lbs/ft)	0.129
Outside diameter (in)	0.594	Ultimate Tension (lbs)	8,106
Temperature at which data below were obtained		(deg F)	70

Outer strands	Final modulus of elasticity (psi/100)	17,904
	Thermal expansion coeff. (/100 deg F)	3.86E-04

Generate Coefficients

Polynomial coefficients (all strain in %)					
	A0	A1 (psi/100)	A2	A3	A4
Stress-strain		16,602			
Creep		13,835			

Core strands	Final modulus of elasticity (psi/100)				
(if different from outer strands)	Thermal expansion coeff. (/100 deg F)				
	Polynomial coefficients (all strain in %)				
	A0	A1 (psi/100)	A2	A3	A4
Stress-strain					
Creep					

JEA# CAIFOT48

Product Description: AT-XXX27D6-048-TMEE-JX - Maximum Span 1276 ft

Loading Conditions USER DEFINED

Ice Thickness	0 mm	0 in.
Wind Pressure	1061 N/m ² (149.9 km/hr)	22 psf (93.1 MPH)
Temperature	-1.1 C	30 F
Safety Factor	0 N/m	0 lb/ft

8 Positions
0.7 mm Inner Jacket
2.5 mm Tubes

Tension @ Maximum Span for 1 % Installation Sag

Short Term	1815 kg	4002 lb
Long Term	898 kg	1979 lb

Specifications:

Maximum Span	389 m	1276 ft
Cable Weight	0.185 kg/m	0.124 lb/ft
Cable Diameter	15.2 mm	0.599 in
Installation Temp	20 C	68 F
Cable Modulus	1002.1 kg/mm ²	1425.6 kpsi
Linear Expansion Coefficient	0.00000451 1 / C	0.00000251 1 / F
Estimated Break Load	3283 kg	7240 lb

Maximum Cable Length: Dependent on construction and/or fiber type

Singlemode	7,700 m	25,262 ft
62.5/125 Multimode	7,700 m	25,262 ft

No Loading @ Install Temperature 68 F

Span ft	Sag ft	Install Sag %	Tension lb	Vertical Sag % of Span	Tension lb	Vertical Sag ft	Horizontal Sag ft	Angle Deg
100	1.0	1.00	155	0.2	618	0.2	2.2	84
200	2.0	1.00	310	0.3	1027	0.6	5.4	84
300	3.0	1.00	465	0.3	1378	1.0	9.0	84
400	4.0	1.00	620	0.4	1699	1.5	13.0	84
500	5.0	1.00	775	0.4	2001	1.9	17.3	84
600	6.0	1.00	930	0.4	2286	2.4	21.8	84
700	7.0	1.00	1085	0.4	2560	2.9	26.5	84
800	8.0	1.00	1241	0.4	2826	3.5	31.3	84
900	9.0	1.00	1396	0.4	3084	4.0	36.3	84
1000	10.0	1.00	1551	0.5	3335	4.6	41.5	84
1100	11.0	1.00	1706	0.5	3581	5.2	46.7	84
1200	12.0	1.00	1861	0.5	3822	5.8	52.1	84
1276	12.8	1.00	1979	0.5	4002	6.3	56.3	84

All Loading Conditions @ Temperature 30 F

The recommended maximum space potential at ADSS attachment point is 25 kV

Dead End Assembly:

MOSDORFER Dead-End: N/A
PLP Dead-End: 2872203C1E1, Max. Tension: 7,500 lbs. (1135 kg)

Slack Storage Devices: Not recommended for TR cables

Note recommended for tracking Applications

Fixed Tangent Support (Line Angle Changes <= 20 deg & Spans <= 600 ft (183 m))

MOSDORFER: Support Clamp: FOSC 0625 Not recommended for Tracking Applications
PLP Dielectric Block Not recommended for Tracking Applications
PLP: Aluminum Support: 4450102 Not recommended for Tracking Applications

Heliformed Suspension Units (Line angle changes <= 30 degrees):

PLP: 43009965YC :Spans 1200ft to 2000ft (365m to 610m)
PLP: 4470202-S Aluminum Suspension with SRR rods, Max Span: 1200 ft (365m)

Suspended Support (Line Angle Changes <= 20 deg & Spans <= 600 ft (183 m))

PLP: Aluminum Suspension: 4450202-S Not recommended for Tracking Applications

Vibration Dampers, see Application Note 812 for recommendations:

MOSDORFER Vibration Dampers: SVD0564
PLP Vibration Dampers: 50509862

Low Tension / Short Span Hardware:

MOSDORFER Light Tension DE not recommended for Tracking Applications
PLP Light Tension DE not recommended for Tracking Applications
PLP Lite Support not recommended for Tracking Applications
PLP PGTTH Dead End: Not Available

Down Lead Cushion & Abrasion Protector:

PLP: 8003043, Add "H1" - Wood Attachment Kit & "LTC1" - Lattice Clamp Kit
PLP Abrasion Protector: PTG-0203 Length: 6 ft

Corona Coils recommended contact cable manufacturer

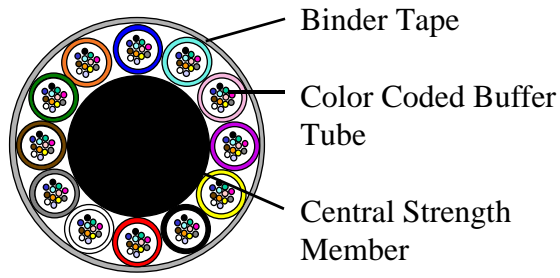
PLP: Sized to fit appropriate hardware, part numbers available upon request

Specification DNA-31428

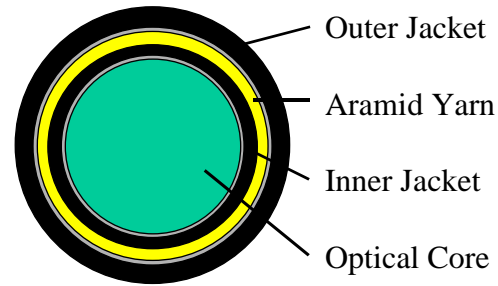
Tracking Resistant ADSS Cable

AC072AJ6C11BC4

Representative 12 unit Fiber Optic Core



Representative AFL-ADSS® Fiber Optic Cable



Sag / Tension Performance

Span Length (ft)		1,000								
Condition	Wind (mi/hr)	Radial Ice (inches)	Add'l Load (lbs/ft)	Input Data			Resultant Data			
				Vert. (ft)	Horiz. (ft)	Vector (ft)	Vert. (ft)	Horiz (ft)	Vector (ft)	Tension (lbs)
Installation	---	---	---	10.0	---	---	10.00	---	10.0	2,185
Installation	---	---	---	10.0	---	---	10.00	---	10.0	2,185
Ice Alone	---	---	---	---	---	---	---	---	---	---
Ice Alone	---	---	---	---	---	---	---	---	---	---
Wind Alone	92.0	---	---	---	---	---	5.65	40.9	41.3	3,869
Wind Alone	92.0	---	---	---	---	---	5.65	40.9	41.3	3,869
Ice and Wind	---	---	---	---	---	---	---	---	---	---
Ice and Wind	---	---	---	---	---	---	---	---	---	---
NESC Light	60.0	---	0.1	---	---	---	8.35	25.7	27.0	2,848
NESC Light	60.0	---	0.1	---	---	---	8.35	25.7	27.0	2,848
Other	---	---	---	---	---	---	---	---	---	---
Other	---	---	---	---	---	---	---	---	---	---

Standards

Designed and Manufactured in accordance with the following:

Cable	IEEE 1222
Fiber	IEC 60793, ITU-T G.65x Series
Color Code	ANSI/EIA 359-A, 598-A, IEC 60304

Specification DNA-31428

Mechanical / Physical Details

Approximate Cable Diameter		17.8 mm	0.701 in
Approximate Cable Weight		260 kg/km	0.175 lbs/ft
Maximum Rated Cable Load (MRCL)		1,954 kg	4,309 lbs
Approximate Cable Breaking Strength		3,126 kg	6,891 lbs
Minimum Bending Radius	Static	18 cm	7 in
	Dynamic	36 cm	14 in
Coefficient of Linear Expansion		1.31E-05 1/°C	7.26E-06 1/°F
Cable Modulus	Initial	7.00 kN/mm²	1,015.5 kpsi
	Final	7.55 kN/mm²	1,095.2 kpsi
	10 Year	5.83 kN/mm²	846.3 kpsi
Environmental Temperature Recommendations			
	Storage	-50 to +70 °C	-58 to +158 °F
	Operation	-40 to +70 °C	-40 to +158 °F
	Installation	-30 to +70 °C	-22 to +158 °F

Optical Details

Attenuation Characteristics for Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers

Max Individual

0.35 dB/km 1310 nm

0.25 dB/km 1550 nm

72 Fiber ADSS Core (12 - 6 fiber buffer tubes)

Unit	Fiber Type	Fiber Count
Blue	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Orange	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Green	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Brown	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Slate	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
White	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Red	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Black	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Yellow	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Violet	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Rose	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Aqua	Corning® SMF-28e+™ Singlemode with NexCor™ Technology fibers	6
Total Fiber Count		72

Standard Fiber Color Code

Fiber No.	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Rose	Aqua

- 1) Designs with more than 12 fibers per tube will use the standard color code and binders for identification of the fibers.
- 2) Designs with mixed fiber types will have multimode or NZDS fibers in the first tube(s) followed by single-mode fibers in the last tube(s).

Installation and Handling Recommendations

Specification DNA-31428

AFL to request copies.

Recommended Installation Procedures for All-Dielectric, Self-Supporting (ADSS) Fiber Optic Cable

AFL-ADSS® Fiber Optic Cable Installation Video

Installation Instructions for Installing All-Dielectric, Self-Supporting (ADSS) in an AFL Telecommunications Splice Enclosure

Fiber Optic Cable Receiving, Handling and Storage. Document ACS-WI-809

Specification DNA-31428

Quick Reference Installation Notes

Approximate Cable Diameter	17.80 mm	0.701 in
Maximum Stringing Tension (at tensioner)*	625 kg	1,378 lbs
Minimum Bull Wheel Diameter	125 cm	49 in
Stringing Sheave Diameter**	72 cm	28 in
Minimum Bending Radius		
Cable		
Static (No load)	18 cm	7 in
Dynamic (under tension)	36 cm	14 in
Fiber		
After Installation (Static)	3.8 cm	1.5 in
Plastic Buffer Tube		
After Installation (Static)	8 cm	3 in

* - The stringing tension is always measured at the tensioner side. In general the maximum stringing tension should be a half of the maximum sagging tension and never should exceed 20% RBS of the ADSS Cable.

** - The value indicated is for the first and last structures of the pull and is based on 40 times the diameter of the ADSS cable. Smaller diameters can be used at tangent structures. Reference AFL's installation instructions for more details.

Reference AFL's "Recommended Installation Procedures for All-Dielectric, Self-Supporting (ADSS) Fiber Optic Cable" for detailed installation instructions.

Shipping Reels

Reel Type	FL	TR	DR	OW	Tare (kgs)	FL	TR	DR	OW	Tare (lbs)	Capacity (meters)	Capacity (feet)
Wood	168	91	91	107	260	66	36	36	42	573	3,720	12,200
Wood	183	91	91	107	300	72	36	36	42	662	4,860	15,940
Wood	213	86	89	104	385	84	34	35	41	849	7,000	22,960
Steel	152	81	81	97	345	60	32	32	38	761	2,740	8,980
Steel	183	91	102	107	540	72	36	40	42	1,191	4,420	14,500
Steel	213	114	107	130	773	84	45	42	51	1,704	7,000	22,960

FL - Flange Diameter; TR - Inside Traverse Width; DR - Drum Diameter; OW - Outside Overall Width
Arbor Hole Diameter: Wood: 3-1/8in (7.9cm)
Steel: 3in (7.6cm)

Maximum lengths shown are the longest lengths that AFL offers. Longer lengths may be possible.

Ordered lengths should include a distribution of lengths, i.e., all reels cannot be ordered at the maximum.

A typical reel length distribution is as follows:

6000m – 7000m ~ 15% of reels
4500m – 6000m ~ 55% of reels
2500m – 4500m ~ 25% of reels
<2500m ~ 5% of reels

Wood reels with flex-wrap covering are standard. Non-returnable steel reels and/or wood lagging are available upon request. Additional reel sizes may be available upon request.

Steel reels are recommended for long term storage. Reference AFL's "Fiber Optic Cable Receiving, Handling and Storage" document for additional information.

Specification DNA-31428

The Screen Inputs for ADSS cables in PLS Cad

Cable Data			
Name:			
Description:	AFL ADSS DNA-31428 AC072AJ6C11BC4		
Cross section area (in ²)	0.3857	Unit weight (lbs/ft)	0.175
Outside diameter (in)	0.701	Ultimate Tension (lbs)	6,891
Temperature at which data below were obtained		(deg F)	70

Outer strands	Final modulus of elasticity (psi/100)	10,952
	Thermal expansion coeff. (/100 deg F)	7.26E-04

Generate Coefficients

Polynomial coefficients (all strain in %)					
	A0	A1 (psi/100)	A2	A3	A4
Stress-strain		10,155			
Creep		8,463			

Core strands	Final modulus of elasticity (psi/100)				
(if different from outer strands)	Thermal expansion coeff. (/100 deg F)				
Polynomial coefficients (all strain in %)					
	A0	A1 (psi/100)	A2	A3	A4
Stress-strain					
Creep					

SECTION VI - TECHNICAL SPECIFICATIONS**PART A - OVERHEAD MULTIPLEX CABLES****1. DESCRIPTION**

Multiplex is a self-supporting cable comprised of one or more insulated conductors and one bare neutral conductor (Messenger) which serves as the supporting member. In service-drop applications, the cable shall be designed to be connected between the power line secondary and the service entrance cable on the customer's building. The cable may also be used as pole line secondary with service taps at the pole or in mid span. The cable must meet the requirements of ICEA Specification S-66-524 except as noted herein.

2. ASSEMBLY

The one, two or three insulated conductors of multiplex shall be tightly twisted around the bare neutral conductor with a lay of 25 to 50 times the diameter of one of the insulated conductors. Pre-Assembled Parallel (PAP) conductor shall be stacked and lashed according to the latest Standards. The direction of lay of the assembly is to be right hand. No fillers or additional coverings are to be applied.

3. CONDUCTORS

The insulated conductors are to be stranded AAC, 1350-H19 aluminum, manufactured in accordance with the latest issues of ASTM B 231. Neutral conductor shall be uncovered AAAC, 6201-T81 bare aluminum, in accordance with the latest issue of ASTM.

4. INSULATION

The circumference of the conductor strands are to be covered with a mylar tape to ease in the removal of the insulation. The mylar tape is to be colored other than black and clearly recognizable to distinguish it from the insulation. The insulation shall be cross-linked polyethylene compound resistant to weathering, abrasion, tearing, cutting and chemical attack. Color of the insulation is to be black.

<u>JEA</u> <u>ITEM ID</u>	<u>SIZE</u>	<u>TYPE</u>	<u>CODE</u> <u>WORD</u>
CAI OS 001	6	DUP	Vizsla
CAI OS 008	2	TRI	Solaster
CAI OS 009	1/0	TRI	Echinus
CAI OS 004	2	QUAD	Belgian
CAI OS 005	2/0	QUAD	Thoroughbred
CAI OS 006	4/0	QUAD	Walking
CAI OS 007	636	QUAD	Dunpap
CAI OS 003	4/0	PAP	Vicksburg
CAI OS 002	2/0	PAP	Mesa Verde

<u>JEA ITEM ID</u>	<u>COND. SIZE PHASE</u>	<u>COND. SIZE NEUT</u>	<u>COND. SIZE STRAND</u>	<u>INSULATION THICKNESS</u>	<u>REEL DESIGNATION</u>
CAI OS 001	6 AWG	6 AWG	7	.045"	NRC 30.18
CAI OS 008	2 AWG	4 AWG	7	.045"	NRC 36.24
CAI OS 009	1/0 AWG	2 AWG	19/7	.060"	NRC 36.24
CAI OS 004	2 AWG	2 AWG	7	.045"	NRC 42.26
CAI OS 005	2/0 AWG	2/0 AWG	19/7	.060"	NRC 50.32
CAI OS 006	4/0 AWG	4/0 AWG	19/7	.060"	NRC 50.32
CAI OS 007	636 KCM	636 KCM	37	.060"	NRC 50.32
CAI OS 003	4/0 AWG	4/0 AWG	19/7	.060"	NRC 42.26
CAI OS 002	2/0 AWG	2/0 AWG	7	.060"	NRC 42.26

5. PHASE IDENTIFICATION

- 5.1. Two conductor - All duplex (single phase) cables
- 5.2. Three conductor - All triplex and PAP (single phase) cables
- 5.3. Four conductor - All quadruplex (three phase) cables shall have one phase conductor permanently marked with a single ridge extruded directly into the insulation, one phase conductor permanently marked with two ridges extruded directly into the insulation, and the third phase conductor with no ridges.

6. APPROVED MANUFACTURERS

Listed below are the current approved cable manufacturers:

Alcan
Southwire
Phillips
Cablec (BICC)
Pirelli
Alcatel Wire & Cable
ACPC
Nexams

TECHNICAL SPECIFICATIONS**TYPE RHW-2 OR USE-2 CABLE****1. DESCRIPTION**

Insulated type RHW-2 or USE-2 (underground service entrance cable) as approved by the National Electrical Code and Underwriters' Laboratories, for use as service conductors for aerial applications, in conduit, trays, troughs, ducts or buried directly in the ground.

2. APPLICABLE STANDARDS

Physical and electrical characteristics of material supplied under this specification shall meet or exceed the following latest ASTM, AEIC, EEI, NEMA and ICEA specifications and/or testing procedures.

Type RHW-2 or USE-2 cable to be manufactured in accordance with the latest applicable issues of the following specific industry standards:

ASTM B800	8000 Series Aluminum Alloy Wire for Electrical Purposes, Annealed-Intermediate Tempers
ASTM B801	Concentric Lay Stranded Conductors of 8000 Series Aluminum for Aluminum Alloy for Subsequent Covering or Insulation
ASTM B3	Copper wire, soft or annealed.
ASTM B8	Copper conductors, concentric lay stranded, hard, medium hard, or soft.

Underwriters' Laboratories Standards No. 44 for RHW-2
Underwriters' Laboratories Standards No. 854 for USE-2
Federal Specification No. J-C-30B
ICEA Pub. No. S-95-658 Nonshielded 0-2 kV Cables
NEMA Pub. No. WC 70
NEMA Pub. No. WC 26 Wire and Cable Packaging
IEEE 383 Flame Test
National Electric Code

Where a particular product requirement or characteristic is specified in more than one document, the most stringent shall apply

3. DESIGNATION

These cables may be used for branch circuit wiring, as a substitute for single conductor type UF (underground feeder cable) and as a substitute for 600 volt building wire, where operating temperatures do not exceed 75°C in wet or dry locations, with a maximum operating temperature rating of 90°C.

4. CONSTRUCTION

4.1. Conductor

- 4.1.1. Annealed Copper: Solid or concentric stranded soft copper conforming with ASTM Specifications B3 or B8, and Underwriters' Laboratories Standard UL44 for rubber insulated wires, and UL854 for service cables.
- 4.1.2. 8000 series aluminum alloy, class B stranding, Aluminum: Conductors No. 8 AWG solid and smaller shall be three-quarter hard aluminum. Stranded conductors No. 8 AWG and larger shall be either three-quarter hard or ½ hard aluminum in accordance with Underwriters' Laboratories Standards No. 44 and No. 854.

4.2. Insulation

- 4.2.1. Conductors are to be insulated with XLPE polyethylene conforming to Underwriters' Laboratories requirements for types USE and RHW insulation.
- 4.2.2. The insulation must be resistant to abrasion, mechanical damage, chemicals, oil, ozone, sunlight, moisture and crushing.
- 4.2.3. As mentioned, the cable insulation shall be rated for use in indoor cable trays.
- 4.2.4. Sequential footage markings shall be provided on the conductor(s), identified in Section 10, at a maximum of every three feet. Footage markings required on one phase of triplexed conductor.
- 4.2.5. The use of mylar tape is acceptable, but not required.

5. CABLE ASSEMBLY

JEA item ID CAI RH 008 shall be paralleled on reels as described in Section 10.

6. PHASE IDENTIFICATION

- 6.1. The conductor will bear the required Underwriters' Laboratories surface marking, "Mfg. Name XLP Type USE-2 or RHW-2 (size) CU - 600V (UL)". For copper conductors, the legend will have "CU" following conductor size.
- 6.2. Triplexed conductor shall have A,B,C or 1,2,3 designation marked on the cable.

7. DIMENSIONS AND DATA

Approved manufacturers for each bid item shall be notified and required to submit approval drawings and documentation that includes the cross sectional drawing of the cable and dimensions including: Outside dimension, conductor dimension. Ampacities, impedance values, and cable weight per thousand feet (lbs/1000ft) shall also be included. In addition, the manufacturer and designation of the insulation compounds used in the production of the cable shall be provided on each drawing. At the time of notification, all required drawings/documentation must be received within the specified time period and approved by JEA Standards for specification conformance.

8. TESTING

- 8.1. Each length of completed cable shall be tested, electrically and physically, in accordance with ICEA S 66-524.
- 8.2. Certified test reports shall be furnished on all cables shipped. The report shall include the master reel numbers, JEA item ID, purchase order number, shipping reel number(s) and the actual test results compared to the required values.
- 8.3. Send the Certified Test Reports to:
- JEA UG Distribution Standards
21 West Church St., Tower 10th Floor
Jacksonville, Florida 32202
- 8.4. Each length of completed cable shall be tested in accordance with the appropriate industry test.

9. SHIPPING

- 9.1. Each reel shall be shipped complete with protective cover and identification marking for storage. Non-returnable wood reels shall meet the requirements of NEMA WC-26, Class II. The reels must be able to withstand shipping, handling, and storage for at least one year without decomposition. Sizes indicated are maximum.
- 9.2. Any material shipped to JEA and deemed unacceptable shall be returned to the manufacturer at his expense.
- 9.3. Cable shall be shipped on non-returnable wooden reels and bear Underwriter's Laboratories, Inc. labels. Standard packages are in lengths and styles as shown:

10. SPECIFIC REQUIREMENTS

<u>JEA ITEM ID</u>	<u># of</u> <u>Cond.</u>	<u>CONDUCTOR</u>			<u>INSULATION</u> <u>MILS</u>	<u>MINIMUM</u> <u>LENGTH</u> <u>PER REEL</u>	<u>REEL</u> <u>TYPE</u>
		<u>SIZE</u>	<u>TYPE</u>	<u>STR</u>			
CAI RH 001	1	4	CU	7	60	1000 FT	NR 20.10
CAI RH 002	1	2	CU	7	60	1000 FT	NR 24.09
CAI RH 003	1	1/0	CU	19	80	1000 FT	NR 24.12
CAI RH 004	1	2/0	CU	19	80	1000 FT	NR 24.18
CAI RH 005	1	4/0	CU	19	80	1000 FT	NR 27.18
CAI RH 006	1	300	CU	37	95	1000 FT	NR 30.18
CAI RH 007	1	500	CU	37	95	1000 FT	NR 32.24
CAI RH 008*	3	500	CU	37	95	1000 FT	NR 80.60

* CAI RH 008 is a paralleled, 3-1/C 500Kcmil cable.

Notes: Footage markings shall be provided on JEA Item ID's: CAI RH 005, CAI RH 007 and CAI RH 008. See Section 4.2.4.

Cable shall be supplied on the listed reel sizes and reel lengths: Reel length tolerance is -0% +10%.

11. APPROVED MANUFACTURERS

List of approved manufactures can be seen in the latest copy of the Master Material Catalog. However, the approved manufacturers still must have their drawings pre-approved before providing a quotation as stated in section 12.

12. SUBMITTAL REQUIREMENTS

THE FOLLOWING INFORMATION MUST BE PROVIDED BY THE RESPONDENT WHO RANKS FIRST AFTER THE BAFO SUBMITTAL, AND BE APPROVED BY THE STANDARDS ENGINEER BEFORE A MANUFACTURER CAN BE DEEMED THE AWARDEE OF THE CONTRACT (DOES NOT APPLY TO SPOT BUYS):

- 12.1. Manufacturer must submit one copy of the dimensions and data drawings, showing all required information as stated in this specification for each item, specifically listing the item ID.
- 12.2. Approved manufacturer drawings shall be marked approved and signed by the standards engineers and then a copy returned to the manufacturer.

THE FOLLOWING INFORMATION MUST BE FINALIZED PRIOR TO SHIPMENT OF MATERIAL:

- 12.3. Drawings sent with quotation must be re-submitted prior to shipment of any items to insure there have been no material or design changes. If changes are required they must be noted by the manufacturer and approved by the appropriate JEA standards engineer.

TECHNICAL SPECIFICATIONS**TYPE UF-B UNDERGROUND SECONDARY CABLE****1. DESCRIPTION**

Underground feeder cable, type UF-B, shall be suitable for operation at 600 volts or less in all installations as specified in the National Electric Code (NEC).

2. SPECIFICATIONS

Underground cable shall meet or exceed the latest edition of the following industry standards except where specifically noted:

Underwriters Laboratories Standard UL 493

National Electric Code, Article 339

Federal Specification J-C-30B

ASTM B3 Copper wire, soft or annealed.

ASTM B8 Copper conductors, concentric lay stranded, hard, medium hard, or soft.

Where a particular product requirement or characteristic is specified in more than one document, the most stringent shall apply

3. DESIGNATIONS

Conductor shall be rated for operation at 90 degrees C, with the ampacity limited to that for 60 degree C, as specified by the National Electric Code.

4. CONSTRUCTION**4.1. Conductor**

4.1.1. Solid annealed copper, conforming with ASTM Specifications B3 and B8.

4.1.2. Individual conductors are to be insulated with polyvinyl chloride (PVC), nylon jacketed, conforming to Underwriters' Laboratories Standard UL 493

4.2. Insulation

4.2.1. An overall jacket of gray, sunlight, moisture and fungus resistant PVC shall be applied over the assembled conductors.

4.2.2. Thickness of jacket to be in accordance with Underwriters' Laboratories Specifications for type UF-B.

4.2.3. Jacket to have surface printed information as to number of conductors, voltage and size, in accordance with the National Electrical Code Standards.

4.2.4. The cable shall bear UL approved label(s).

5. ASSEMBLY

The individually insulated, color coded conductors are to lay parallel without a grounding conductor.

6. PHASE IDENTIFICATION

Individually insulated conductors are to be color coated as follows:

2 Conductors – Black and White

7. DIMENSIONS AND DATA

Approved manufacturers for each bid item shall be notified and required to submit approval drawings and documentation that includes the cross sectional drawing of the cable and dimensions including: Outside dimension, conductor dimension. Ampacities, impedance values, and cable weight per thousand feet (lbs/1000ft) shall also be included. In addition, the manufacturer and designation of the insulation compounds used in the production of the cable shall be provided on each drawing. At the time of notification, all required drawings/documentation must be received within the specified time period and approved by JEA Standards for specification conformance.

8. TESTING

JEA reserves the right to subject any item purchased from this bid to recognized test procedures by either the manufacturer or an independent laboratory, at JEA expense. Any material failing such tests shall be replaced at supplier's expense.

Certified test reports shall be furnished on all cables shipped. The report shall include the master reel numbers, JEA item ID, purchase order number, shipping reel number(s) and the actual test results compare to the required values.

Send the Certified Test Reports to:

JEA UG Distribution Standards
21 West Church St., Tower 5th Floor
Jacksonville, Florida 32202

9. SHIPPING

Each reel shall be shipped complete with protective cover and identification marking for storage. Non-returnable wood reels shall meet the requirements of NEMA WC-26, Class II. The spool(s) must be able to withstand shipping, handling, and storage for at least one year without decomposition.

10. SPECIFIC REQUIREMENTS

To be supplied in standard packages as stated below:

JEA ITEM ID	SIZE AWG	NO. STRS.	Min. SPOOL Length
CAI UF 001	12/2 (NO GROUND)	1	1000'

Cable shall be supplied with the reel length tolerance of -0% +10%.

11. APPROVED MANUFACTURERS

List of approved manufactures can be seen in the latest copy of the Master Material Catalog. However, the approved manufacturers still must have their drawings pre-approved before providing a quotation as stated in section 12.

12. SUBMITTAL REQUIREMENTS

THE FOLLOWING INFORMATION MUST BE PROVIDED PRIOR TO BID AND BE APPROVED BY THE STANDARDS ENGINEER BEFORE A MANUFACTURER CAN SUBMIT A QUOTATION:

- 12.1. Manufacturer must submit one copy of the dimensions and data drawings, showing all required information as stated in this specification for each item, specifically listing the item ID.
- 12.2. Approved manufacturer drawings shall be marked approved and signed by the standards engineers and then a copy returned to the manufacturer. No manufacturer may bid unless their drawings have been approved by the standards engineer.

THE FOLLOWING INFORMATION MUST BE FINALIZED PRIOR TO SHIPMENT OF MATERIAL:

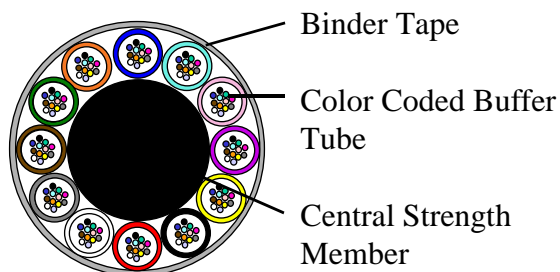
- 12.3. Drawings sent prior to quotation must be re-submitted prior to shipment of any items to insure there have been no material or design changes. If changes are required they must be noted by the manufacturer and approved by the appropriate JEA standards engineer.

Specification DNL-3116

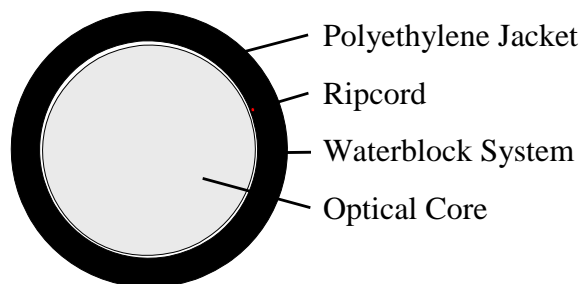
Non-Armored Loose Tube Cable

Representative 12 unit Fiber Optic Core

Reference "Optical Details" for actual fiber distribution



Non-Armored Loose Tube Cable



LE1449CC101N1

144 Single-mode

Standards

Designed and Manufactured in accordance with the following:

Cable	GR20-CORE, EIA/TIA, REA/RUS PE-90
Fiber	IEC 60793, ITU-T G.65x Series
Color Code	ANSI/EIA 359-A, 598-A, IEC 60304

Mechanical / Physical Details

Approximate Cable Diameter		17.0 mm	0.669 in
Approximate Cable Weight		223 kg/km	0.150 lbs/ft
Outer Jacket Type		Medium Density Polyethylene (MDPE)	
Outer Jacket Color		Black	
Maximum Tensile Load	Short Term	270 kg	600 lbs
	Long Term	90 kg	200 lbs
Minimum Bending Radius	Static	17 cm	7 in
	Dynamic	34 cm	14 in
Environmental Temperature Recommendations			
	Storage	-50 to 70 °C	-58 to 158 °F
	Operation	-40 to 70 °C	-40 to 158 °F
	Installation	-30 to 70 °C	-22 to 158 °F

Specification DNL-3116

Optical Details

Attenuation Characteristics for Single-mode fibers

Max Individual

0.35 dB/km 1310 nm

0.25 dB/km 1550 nm

144 Fiber Loose Tube Core (12 - 12 fiber buffer tubes)		Fiber Count
Unit	Fiber Type	
Blue	Single-mode fibers	12
Orange	Single-mode fibers	12
Green	Single-mode fibers	12
Brown	Single-mode fibers	12
Slate	Single-mode fibers	12
White	Single-mode fibers	12
Red	Single-mode fibers	12
Black	Single-mode fibers	12
Yellow	Single-mode fibers	12
Violet	Single-mode fibers	12
Rose	Single-mode fibers	12
Aqua	Single-mode fibers	12
Total Fiber Count		144

Standard Fiber Color Code

Fiber No.	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Rose	Aqua

Designs with more than 12 fibers per tube will use the standard color code and binders for identification of the fibers.

Installation and Handling Recommendations

Installation and cable preparation procedures are outlined in the AFL documents listed below. Contact AFL to request copies.

Installation Procedures for AFL Loose Tube Fiber Optic Cables

Installation Instructions for Installing Loose Tube Fiber Optic Cable in an AFL Telecommunications Splice Enclosure

Fiber Optic Cable Receiving, Handling and Storage. Document ACS-WI-809

Specification DNL-3116

Installation Details		
Approximate Cable Diameter	17.00 mm	0.669 in
Minimum Bending Radius		
Cable		
After Installation (Static)	17 cm	7 in
During Installation (Dynamic)	34 cm	14 in
Fiber		
After Installation (Static)	3.8 cm	1.5 in
Plastic Buffer Tube		
After Installation (Static)	8 cm	3 in
Reference AFL's "Installation Procedures for AFL Loose Tube Fiber Optic Cables" for detailed installation instructions.		

Shipping Reels												
Reel Type	FL	TR	DR	OW	Tare (kgs)	FL	TR	DR	OW	Tare (lbs)	Capacity	
		(cm)					(in)				(meters)	(feet)
Wood	147	81	71	97	200	58	32	28	38	441	3,310	10,850
Wood	168	91	91	107	260	66	36	36	42	573	4,430	14,530
Wood	183	91	91	107	300	72	36	36	42	662	5,830	19,120
Wood	213	86	89	104	385	84	34	35	41	849	7,000	22,960
Steel	152	81	81	97	156	60	32	32	38	344	3,260	10,690
Steel	183	91	102	107	264	72	36	40	42	582	5,260	17,250
Steel	213	114	107	130	372	84	45	42	51	820	7,000	22,960
FL - Flange Diameter; TR - Inside Traverse Width; DR - Drum Diameter; OW - Outside Overall Width Arbor Hole Diameter: Wood: 3-1/8in (7.9cm) Steel: 3in (7.6cm) Maximum lengths shown are the longest lengths that AFL offers. Longer lengths may be possible. Ordered lengths should include a distribution of lengths, i.e., all reels cannot be ordered at the maximum. A typical reel length distribution is as follows: 6000m – 7000m ~ 15% of reels 4500m – 6000m ~ 55% of reels 2500m – 4500m ~ 25% of reels <2500m ~ 5% of reels Wood reels with flex-wrap covering are standard. Non-returnable steel reels and/or wood lagging are available upon request. Additional reel sizes may be available upon request. Steel reels are recommended for long term storage. Reference AFL's "Fiber Optic Cable Receiving, Handling and Storage" document for additional information.												

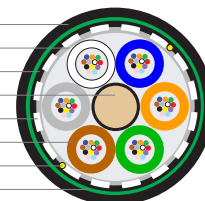


ExpressLT™ Dry

Dry loose tube cable (2.5 mm)



MDPE Outer Jacket
Water Blocking Tape
MDPE Inner Jacket (Double Jacket Designs Only)
Central Strength Member
Outer Strength Members (where applicable)
Dry Buffer Tube Containing up to 12 Fibers
Ripcord
ezPREP® Corrugated Steel Armor (optional)



A versatile, multi-purpose fiber cable designed for ease of use and buffer tube mid-span storage applications

Overview

Prysmian's popular ExpressLT™ cable combines buffer tubes with enhanced flexibility, a completely dry water-blocking system, and optional ezPREP® armor. The buffer tubes are also rated for mid-span storage applications. This combination of features makes ExpressLT™ an ideal solution for applications requiring frequent sheath access and express tube storage.

Product Snapshot

Applications	Multi-purpose outdoor, aerial lashed, duct, direct buried (when armored)
Constructions	Dielectric, armored, double armored, dual jacket
Count	4 to 432 fibers in color-coded buffer tubes
Fiber Types	Single-mode, multimode, bend-insensitive SM, NZDS
Options	Steel central member, 22 or 24 AWG copper pair(s), 16 AWG tonewire, striped Jacket, factory-installed pulling eye
Similar Alternatives	Gel-filled buffer tubes / LT 2.0 / heavy duty / central / indoor-outdoor / indoor / self-support / microduct
Performance	Tested in accordance with TIA 455 series FOTPs for fiber optic cables. Complies with ICEA 640, RUS 7 CFR 1755 (PE90 listed), Telcordia GR-20, and IEC 60794-3-11

**RUS
LISTED**

Features and Benefits

Easy Cable Entry and Preparation

- Dry water-blocked core speeds cable access
- Dry, water-blocked tubes reduce prep time by an average of 15 minutes per cable end
- Available with ezPREP® armor to allow easy access to the core in mid-sheath entries
- Reverse oscillating stranded core facilitates mid-span access of fibers. Tubes can easily be removed from the core
- Ripcord speeds cable entry & outer jacket removal

Available with ezPREP® Armor

- The jacket can be easily separated from the armor without a heat gun or torch
- Armored cable access, bonding and grounding are faster, easier and safer

Flexible Routing and Termination

- Buffer tubes can be stored in FTTx pedestals, closures and cabinets in lengths up to 20'
- 2.5mm buffer tubes with enhanced flexibility simplify routing and splice preparation

Multi-Purpose Design

- Suitable for aerial lashed, duct, and direct buried installation (when armored)
- Small diameter and light weight, extends reel and installation lengths
- Optional ezPREP® corrugated steel tape armor provides mechanical protection and rodent resistance

ExpressLT™ Dry

Dry loose tube cable (2.5 mm)

Dielectric (Non-Armored) (EDH1JKT)

Fiber Count	# of Buffer Tubes	Diameter inches (mm)	Approximate Cable Weight lb/kft (kg/km)	Bend Radius Load inches (cm)	Bend Radius No Load inches (cm)
4 to 60	5	0.40 (10.1)	43 (64)	8 (20)	4 (10)
62 to 72	6	0.43 (10.9)	50 (75)	8 (22)	4 (11)
74 to 96	8	0.50 (12.6)	65 (97)	10 (25)	5 (13)
98 to 120	10	0.55 (14.1)	81 (121)	11 (28)	6 (14)
122 to 144	12	0.63 (15.9)	105 (156)	13 (32)	6 (16)
146 to 216	18	0.63 (15.9)	105 (156)	13 (32)	6 (16)
228 to 264	22	0.68 (17.3)	128 (190)	14 (35)	7 (17)
276 to 288	24	0.72 (18.3)	145 (216)	14 (37)	7 (18)
290 to 432	36	0.80 (20.4)	181 (270)	16 (41)	8 (21)

Single Jacket Armored (SP) (EDH1A1J)

Fiber Count	# of Buffer Tubes	Diameter inches (mm)	Approximate Cable Weight lb/kft (kg/km)	Bend Radius Load inches (cm)	Bend Radius No Load inches (cm)
4 to 60	5	0.46 (11.8)	89 (132)	9 (24)	5 (12)
62 to 72	6	0.50 (12.6)	97 (145)	10 (25)	5 (13)
74 to 96	8	0.56 (14.3)	116 (172)	11 (29)	6 (14)
98 to 120	10	0.62 (15.8)	143 (213)	12 (32)	6 (16)
122 to 144	12	0.69 (17.6)	176 (262)	14 (35)	7 (18)
146 to 216	18	0.70 (17.9)	170 (254)	14 (36)	7 (18)
228 to 264	22	0.76 (19.4)	190 (283)	15 (39)	8 (19)
276 to 288	24	0.81 (20.7)	208 (310)	16 (42)	8 (21)
290 to 432	36	0.90 (23.0)	253 (376)	18 (46)	9 (23)

Double Jacket Single Armored (PSP) (EDH1A2J)

Fiber Count	# of Buffer Tubes	Diameter inches (mm)	Approximate Cable Weight lb/kft (kg/km)	Bend Radius Load inches (cm)	Bend Radius No Load inches (cm)
4 to 60	5	0.53 (13.5)	107 (160)	11 (27)	5 (14)
62 to 72	6	0.55 (14.0)	117 (174)	11 (28)	5 (14)
74 to 96	8	0.61 (15.5)	137 (204)	12 (31)	6 (16)
98 to 120	10	0.67 (17.1)	167 (249)	13 (34)	7 (17)
122 to 144	12	0.74 (18.9)	198 (294)	15 (38)	7 (19)
146 to 216	18	0.76 (19.2)	198 (294)	15 (38)	8 (19)
228 to 264	22	0.80 (20.4)	220 (327)	16 (41)	8 (20)
276 to 288	24	0.86 (21.8)	239 (356)	17 (44)	9 (22)
290 to 432	36	0.94 (24.0)	288 (428)	19 (48)	9 (24)

ExpressLT™ Dry

Dry loose tube cable (2.5 mm)

Dielectric Double Jacket (PDP) (EDHNA2J)

Fiber Count	# of Buffer Tubes	Diameter inches (mm)	Approximate Cable Weight lb/kft (kg/km)	Bend Radius Load inches (cm)	Bend Radius No Load inches (cm)
4 to 60	5	0.46 (11.7)	63 (96)	9 (23)	5 (12)
62 to 72	6	0.48 (12.2)	73 (108)	10 (25)	5 (12)
74 to 96	8	0.54 (13.8)	89 (133)	11 (28)	5 (14)
98 to 120	10	0.61 (15.4)	111 (165)	12 (31)	6 (15)
122 to 144	12	0.67 (17.1)	133 (198)	13 (34)	7 (17)
146 to 216	18	0.67 (17.1)	137 (204)	13 (34)	7 (17)
218 to 264	22	0.74 (18.7)	159 (237)	15 (37)	7 (19)
266 to 288	24	0.78 (19.8)	179 (266)	16 (40)	8 (20)

Double Jacket Double Armored (SPSP) (EDH2A2J)

Fiber Count	# of Buffer Tubes	Diameter inches (mm)	Approximate Cable Weight lb/kft (kg/km)	Bend Radius Load inches (cm)	Bend Radius No Load inches (cm)
4 to 60	5	0.64 (16.3)	182 (272)	13 (33)	6 (16)
62 to 72	6	0.67 (17.1)	194 (289)	13 (34)	7 (17)
74 to 96	8	0.75 (19.1)	226 (336)	15 (38)	8 (19)
98 to 120	10	0.80 (20.4)	258 (384)	16 (41)	8 (20)
122 to 144	12	0.88 (22.4)	312 (465)	18 (45)	9 (22)
146 to 216	18	0.88 (22.4)	305 (454)	18 (45)	9 (22)
218 to 264	22	0.94 (23.9)	338 (503)	19 (48)	9 (24)
266 to 288	24	0.98 (24.9)	368 (547)	20 (50)	10 (25)

Triple Jacket Double Armored (PSPSP) (EDH2A3J)

Fiber Count	# of Buffer Tubes	Diameter inches (mm)	Approximate Cable Weight lb/kft (kg/km)	Bend Radius Load inches (cm)	Bend Radius No Load inches (cm)
4 to 60	5	0.70 (17.8)	215 (320)	14 (36)	7 (18)
62 to 72	6	0.73 (18.6)	228 (339)	15 (37)	7 (19)
74 to 96	8	0.78 (19.9)	265 (394)	16 (40)	8 (20)
98 to 120	10	0.86 (21.9)	313 (466)	17 (43)	9 (22)
122 to 144	12	0.93 (23.7)	367 (546)	19 (47)	9 (24)
146 to 216	18	0.93 (23.7)	367 (546)	19 (47)	9 (24)
218 to 264	22	0.98 (25.0)	402 (598)	20 (50)	10 (25)
266 to 288	24	1.02 (26.0)	429 (639)	20 (52)	10 (26)

Installation

- Maximum installation load: 600 lbf (2700 N)
- Maximum operation load: 180 lbf (800 N)

Temperature Range

- Shipping and Storage: -40° F to +167° F (-40° C to +75° C)
- Installation: -22° F to +140° F (-30° C to +60° C)
- Operation: -40° F to +158° F (-40° C to +70° C)

Ordering Guide

The Prysmian Group part number incorporates several significant attributes involving cable design and optical performance. The appropriate part number can be configured using the process described below

Example: ExpressLT™ dry (gel-free) | single armor single jacket (12 fibers/tube) with 72 single-mode fibers (printed in feet)

1 LENGTH MARKINGS	2 PRODUCT FAMILY	3 CONSTRUCTION	4 FIBER GROUPING	5 FIBER TYPE	6 FIBER COUNT	7 FIBER GRADE
F	EDH	1A1J	12	HB	072	E3

PART NUMBER CONSTRUCTION	
1 LENGTH MARKINGS	F = Feet or M = Meters
2 PRODUCT FAMILY	EDH = ExpressLT Dry
3 CONSTRUCTION	1JKT = Single Jacket 1A1J = Single Armor, Single Jacket 1A2J = Single Armor, Dual Jacket 2A2J = Double Armor, Dual Jacket 2A3J = Double Armor, Triple Jacket NA2J = Non Armored, Dual Jacket
4 FIBER GROUPING	12 = 12f per tube

FIBER INFORMATION

5

FIBER TYPE

SINGLE-MODE

HB = Single-Mode (ITU G.652 C & D) Low Water Peak

ES = Enhanced Single-Mode (ITU G.652 C & D)

CE = Corning™ SMF28e+ Single-Mode

B1 = Bend-Insensitive Single-Mode (ITU G.657.A1 & G.652.D)

B2 = Bend-Insensitive Single-Mode (ITU G.657.A2 & .B2, & G.652.D)

TU = TeraLight Ultra Single-Mode (ITU G.655 & G.656)

LA = NZDSF-LA Single-Mode (ITU G.655)

LE = LEAF NZDSF (ITU G.655)

MULTIMODE

Wavelength (nm)

Bandwidth (MHz)

1 GbE Dist (m)

10 GbE Dist (m)

G6 = OM1 (62.5µm)

G5 = OM2+ BIF (50µm)

G3 = OM3 BIF (50µm)

G4 = OM4 BIF (50µm)

850/1300

850/1300

850/1300

850/1300

200/500

700/500

1500/500

3500/500

300/550

800

1000

1100

33/___

150/___

300/___

550/___

6

FIBER COUNT

004 to 432 fibers

7

FIBER GRADE

SINGLE-MODE

Attenuation (dB/km)

Wavelength (nm)

Fiber Type

E1 = 0.40/0.40/0.30

E3 = 0.35/0.35/0.25

NA = 0.40/0.25

N1 = 0.25

1310/1383/1550

1310/1383/1550

1310/1550

1550

HB, ES, or CE

HB, ES, CE, B1, or B2

TeraLight Ultra Single-Mode

NZDSF-LA Single-Mode

MULTIMODE

Attenuation (dB/km)

Wavelength (nm)

M2 = 3.5/1.0

M3 = 3.0/1.0

850/1300

850/1300

Other cable constructions and fiber performance grades available on request.

TECHNICAL SPECIFICATIONS**UNDERGROUND MULTIPLEX CABLES****1. DESCRIPTION**

This cable is for secondary underground distribution of electrical power on circuits of 600 volts or less and suitable for direct burial in wet or dry locations or duct installation and consists of one, two or three phase conductors and one neutral conductor cabled together with no binder or covering. .

2. APPLICABLE STANDARDS

Physical and electrical characteristics of material supplied under this specification shall meet or exceed the following latest ASTM, AEIC, EEI, NEMA and ICEA specifications and/or testing procedures.

Underground multiplex service cable shall meet or exceed the latest edition of the following specific industry standards:

ASTM B-230	Aluminum Wire, 1350-H19 for Electrical Purposes.
ASTM B-231	Aluminum Conductors, Concentric-Lay-Stranded.
ASTM B-609	Annealed and Intermediate Tempers for Electrical Purposes.
ASTM B-786	19-Wire Combination Unilay-Stranded Aluminum 1350 Conductors for Subsequent Insulation.
ICEA S-66-524	Cross Linked Thermosetting Polyethylene Insulated Wire and Cable for the Transmission
NEMA WC 7	and Distribution of Electrical Energy
NEMA WC 26	Wire And Cable Packaging

Where a particular product requirement or characteristic is specified in more than one document, the most stringent shall apply.

3. DESIGNATIONS

The maximum continuous operating temperature of conductor, at rated load, shall be limited to 90°C, the emergency operating temperature shall not exceed 130°C, and the short circuit operating temperature shall not exceed 250°C as per the latest revision of ICEA S-66-574.

4. CONSTRUCTION**4.1. CONDUCTOR**

- 4.1.1. The conductors are standard class B, compressed or compressed unilay, stranding is allowed, stranded 1350 aluminum, hard drawn or ¾ hard drawn in accordance with ASTM B-231.
- 4.1.2. The diameter of the compressed conductors shall be in accordance with ASTM B-231. If compressed conductor is used, the dimensions over the insulation shall be adjusted accordingly.

4.2. INSULATION

- 4.2.1. The insulation shall be black, LDPE cross linked polyethylene suitable for temperatures defined in section 3 above. The insulation thickness shall be in accordance with ICEA S-66-524.
- 4.2.2. The insulation shall be free stripping. A separator, such as mylar, may be used. If used, the separator shall be applied between the conductor and the insulation, it shall be suitably identified so its presence will be known and it shall be easily removable.
- 4.2.3. One conductor shall have footage markings applied to the cable at a maximum of three foot intervals.
- 4.2.4. The cable shall have permanent contrasting marking on the jacket at interval not to exceed three feet. The marking on each cable jacket shall contain the manufacturer's name, plant designation, conductor size and type, insulation and wall thickness, voltage rating and year of manufacture.

5. CABLE ASSEMBLY

The phase conductors and neutral are twisted together with a left hand lay not greater than 60 times the diameter of one phase conductor.

6. PHASE IDENTIFICATION

The neutral conductor shall have three continuous extruded weather resistant yellow polyethylene stripes, 120 degrees apart. A solid yellow colored neutral may be supplied as an alternative.

7. DIMENSIONS AND DATA

Approved manufacturers for each bid item shall be notified and required to submit approval drawings and documentation that includes the cross sectional drawing of the cable and dimensions including: Outside dimension, conductor dimension. Ampacities, impedance values, and cable weight per thousand feet (lbs/1000ft) shall also be included. In addition, the manufacturer and designation of the insulation compounds used in the production of the cable shall be provided on each drawing. At the time of notification, all required drawings/documentation must be received within the specified time period and approved by JEA Standards for specification conformance.

8. TESTING

Each length of completed cable shall be tested, electrically and physically, in accordance with ICEA S 66-524.

Certified test reports shall be furnished on all cables shipped. The report shall include the master reel numbers, JEA item ID, purchase order number, shipping reel number(s) and the actual test results compare to the required values.

Send the Certified Test Reports to:

JEA UG Distribution Standards
21 West Church Street, Tower 5th Floor
Jacksonville, Florida 32202

9. SHIPPING

Each reel shall be shipped complete with protective cover and identification marking for storage. Non-returnable wood reels shall meet the requirements of NEMA WC-26, Class II. The reels must be able to withstand shipping, handling, and storage for at least one year without decomposition. Water tight end caps shall be installed on each cable end. Sizes indicated are maximum.

Any material shipped to JEA and deemed unacceptable shall be returned to the manufacturer at his expense.

10. SPECIFIC REQUIREMENTS

<u>JEA ITEM ID</u>	<u>CODE WORD</u>	<u>CONDUCTOR SIZE</u>		<u>CONDUCTOR SIZE TYPE</u>
		<u>PHASE</u>	<u>NEUT</u>	
CAI US 002	BLISS OR CONVERSE	2/O AWG	1AWG	Triplex
CAI US 001	REGIS OR SWEETBRIAR	4/O AWG	2/OAWG	Triplex
CAI US 003	CONCORDIA OR WESLAYAN	350 MCM	4/OAWG	Triplex
CAI US 005	SYRACUSE	2/O AWG	1AWG	Quadruplex
CAI US 006	WAKE FOREST	4/O AWG	2/OAWG	Quadruplex
CAI US 007	SLIPPERY ROCK	350 MCM	4/OAWG	Quadruplex
CAI US 008	WOFFORD	500 MCM	350 MCM	Quadruplex

<u>JEA ITEM I.D.</u>	<u>INSULATION THICKNESS</u>		<u>REEL DESIGNATION</u>	<u>MINIMUM LENGTH PER REEL</u>
	<u>PHASE</u>	<u>NEUT</u>		
CAI US 002	80 MILS	80 MILS	NRC 40.24	1000 FT
CAI US 001	80 MILS	80 MILS	NRC 42.26	1000 FT
CAI US 003	95 MILS	80 MILS	NRC 50.32	1000 FT
CAI US 005	80 MILS	80 MILS	NRC 50.32	1000 FT
CAI US 006	80 MILS	80 MILS	NRC 50.32	1000 FT
CAI US 007	95 MILS	80 MILS	NRC 58.32	1000 FT
CAI US 008	95 MILS	95 MILS	NRC 66.32	1000 FT

Cable shall be supplied on the listed maximum reel sizes and reel lengths: Reel length tolerance is -0% +10%.

11. APPROVED MANUFACTURERS

List of approved manufactures can be seen in the latest copy of the Master Material Catalog. However, the approved manufacturers still must have their drawings pre-approved before providing a quotation as stated in section 12.

12. SUBMITTAL REQUIREMENTS

THE FOLLOWING INFORMATION MUST BE PROVIDED PRIOR TO BID AND BE APPROVED BY THE STANDARDS ENGINEER BEFORE A MANUFACTURER CAN SUBMIT A QUOTATION:

- 12.1. Manufacturer must submit one copy of the dimensions and data drawings, showing all required information as stated in this specification for each item, specifically listing the item ID.
- 12.2. Approved manufacturer drawings shall be marked approved and signed by the standards engineers and then a copy returned to the manufacturer. No manufacturer may bid unless their drawings have been approved by the standards engineer.

THE FOLLOWING INFORMATION MUST BE FINALIZED PRIOR TO SHIPMENT OF MATERIAL:

- 12.3. Drawings sent prior to quotation must be re-submitted prior to shipment of any items to insure there have been no material or design changes. If changes are required they must be noted by the manufacturer and approved by the appropriate JEA standards engineer.

SECTION VI - TECHNICAL SPECIFICATIONS**PART B- ALL ALUMINUM CONDUCTOR (AAC)****1. GENERAL**

To furnish complete, factory assembled bare 1350 aluminum overhead conductor for transmission, distribution and secondary voltage applications. The specified cable shall be installed on a grounded wye system having a distribution primary voltages of 2400/4160, 7620/13200 and 15240/26400 volts.

Bare 1350 aluminum conductors suitable for overhead lines of short or moderate spans, where the higher strength of ACSR or aluminum alloy is not required. A concentric-lay-stranded conductor made up of 7, 19, 37, 61 or more wires in 1, 2, 3, 4 or more layers around a central wire, with each successive layer having six more wires than the layer immediately beneath. The aluminum wire shall be made from rod meeting all the requirements of the standard specifications for rolled aluminum rod for electrical purposes.

2. APPLICABLE STANDARDS

Physical and electrical characteristics of material supplied under this specification shall meet or exceed the following latest ASTM, AEIC, EEI, NEMA and ICEA specifications and/or testing procedures.

The following specific standards shall apply:

ASTM B230	Aluminum Wire, 1350-H19, for Electrical Purposes
ASTM B231	Concentric-lay-stranded Aluminum Conductor
WC 53	Packaging Standards for Aluminum and ACSR Conductor

Where a particular product requirement or characteristic is specified in more than one document, the more stringent requirement shall apply.

3. SPECIFICATIONS

- 3.1. AAC conductor shall be made from 1350 aluminum and shall be of the size and type listed in section 6.
- 3.2. Stranding shall be class A. The direction of lay of the outer layer is to be standard right hand.
- 3.3. The cable shall be hard drawn (H19).
- 3.4. The values of rated strength shown are based on the method of calculation given in ASTM B231 and B200.
- 3.5. The center strand of each conductor shall be indented with the manufacturers name and year of manufacture at a maximum interval of three (3) feet along the length of the cable.

4. TECHNICAL DATA

Upon request, Manufacturer shall supply complete Ampacity, SAG/Tension charts and splicing instructions for each size or type of conductor the Manufacturer supplies. The Manufacturer may also be required to supply the results of any tests under applicable standards.

5. PACKAGING

- 5.1. Standard packages are to be in nominal lengths with reels marked to show length per reel. The overall width of reels with the designation on NR 66.28 shall not exceed 34 inches and shall have a minimum of 6,000 feet of conductor on each reel.
- 5.2. Reels shall be supplied meeting or exceeding the minimum requirements of WC53. Returnable reels are to be metal only. Minimum Arbor hole of 3-1/16" shall be supplied. Reels in excess of 10,000 pounds gross weight shall have their arbor holes reinforced to prevent them from going out of round. Reels that do not meet "Reel Designation" for individual conductor will be rejected. Conductor shall be furnished in one continuous length per coil or reel.
- 5.3. Coils shall have an inside diameter between 20-24 inches.
- 5.4. Only one length of conductor will be in a coil or on a reel.

6. SPECIFIC REQUIREMENTS

JEA ITEM ID	CODE WORD	SIZE AND STRANDING	RATED STRENGTH	REEL (LENGTH) DESIGNATION
COB TW 005 *		#4 AWG-SOLID	369#	25# COIL
COB TW 006 *		#2 AWG-SOLID	586#	25# COIL
COB AA 025	TULIP	336 KCM-19	6,150#	NR 66.28(12,030 Ft)
COB AA 026	ORCHID	636 KCM-37	11,400#	NR 66.28((6,200 Ft)
COB AA 027	GOLDENROD	954 KCM-61	16,900#	RMT90.45(10,900Ft)

* NOTE: Use for Tie Wire (EC Grade, Softdrawn)

7. TESTING

- 7.1. The completed cable shall meet or exceed all applicable test and requirements as outlined in the standards.
- 7.2. JEA reserves the right to subject any item, purchased from this bid, to recognized test procedures by an independent laboratory. Any material failing such tests shall be replaced at supplier's expense.
- 7.3. Certified test reports shall be furnished on all cables shipped. The report shall include the master reel numbers, JEA item ID, purchase order number, shipping reel number(s) and the actual test results compare to the required values.
- 7.4. Send the Certified Test Reports to:
JEA Distribution Standards, Supervisor
21 West Church Street, Tower 5
Jacksonville, Florida 32202

8. APPROVED MANUFACTURERS

Listed below are the current approved cable manufacturers:

ACPC, Inc.	Southwire	BICC
Alcan	Alcatel Wire & Cable	

SECTION VI - TECHNICAL SPECIFICATIONS**PART C - ALL-ALUMINUM ALLOY CONDUCTOR (AAAC)****1. DESCRIPTION**

Made by a special process, 6201-T81 is a magnesium-silicide aluminum alloy that is heat-treated to provide strengths usually obtainable only with ACSR. One of the marked advantages of 6201, in addition to light weight, is its high uniformity and consistent electrical properties. AAAC is concentric-lay-stranded similar in construction and appearance to EC all-aluminum conductors (AAC). Although 6201 conductors are slightly more expensive than 5005 or EC conductors, they are the best in certain applications because of their higher strength.

2. SPECIFICATION

Bare 6201-T81 aluminum alloy conductors manufactured in accordance with the latest applicable issues of the following industry specifications:

ASTM B398	6201-T81 Aluminum Alloy Wire
ASTM B399	Concentric-Lay-Stranded 6201-T81 Aluminum Alloy Conductors

3. RATED STRENGTH

The values of rated strength shown are based on the revised method of calculation given in ASTM B399 and all of the latest revisions of these specifications to date.

4. PACKAGING

- 4.1. Standard packages are to be in nominal lengths with reels marked to show length per reel.
- 4.2. Coils and reels are to conform to the aluminum association packaging recommendations.
- 4.3. Only one length of conductor will be in a coil or on a reel.
- 4.4. The overall width of reels with the designation NR 66.28 shall not exceed 34 inches and shall have a minimum of 6,000 feet of conductor on each reel.

JEA ITEM ID	CODE WORD	SIZE (AWG OR MCM) AND STRANDING	RATED STRENGTH	REEL DESIGNATION
COB AA 020	AMES	#2 - 7	2,800#	NR 42.28
COB AA 021	AZUSA	#1/0-7	4,460#	NR 42.28
COB AA 022	AMHERST	#3/0-7	6,790#	NR 42.28
COB AA 023	ALLIANCE	#4/0-7	8,560#	NR 42.28
COB AA 024	ELGIN	652-19	21,900#	NR 66.28

5. APPROVED MANUFACTURERS

Listed below are the current approved cable manufacturers:

ACPC, Inc.	Southwire
Alcan	Cablec (BICC)
Alcatel Wire & Cable	Nexams

SECTION VI - TECHNICAL SPECIFICATIONS**PART O - ALUMINUM CLAD STEEL CONDUCTOR****1. CHARACTERISTICS**

Concentric lay stranded aluminum clad steel built in accordance with ASTM B416.

2. PACKAGING

Size and standard packing quantities below:

ITEM ID	SIZE	PACKING QUANTITY	STANDARD REEL
COB AS 005	3-#6	1105 LB. PER REEL	NR36.16
COB AS 006	7-#7	1650 LB. PER REEL	NR37.20
COB AS 007	7-#10	825 LB. PER REEL	NR30.13

3. APPROVED MANUFACTURERS

Listed below are the current approved cable manufacturers:

Copperweld Bimetallics Group

Hitachi/Conex

SECTION VI - TECHNICAL SPECIFICATIONS**PART G - BARE COPPER STRAND AND CONDUCTOR****1. DESCRIPTION**

Bare copper conductor and strand suitable for overhead distribution circuits or for use as grounding conductors.

2. APPLICABLE STANDARDS

- 2.1. Physical and electrical characteristics of material supplied under this specification shall meet or exceed the following latest ASTM, AEIC, EEI, NEMA and ICEA specifications and/or testing procedures.
- 2.2. The following specific standards shall apply:
- 2.3. Copper strand to be manufactured in accordance with the following:

ASTM B1	Hard Drawn (HD) Copper Wire
ASTM B2	Medium Hard Drawn (MHD) Copper Wire
ASTM B3	Soft Drawn (SD) or Annealed Copper Wire
ASTM B8	Concentric Lay Stranded Copper Conductors
- 2.4. Where a particular product requirement or characteristic is specified in more than one document, the more stringent requirement shall apply.

3. CONSTRUCTION

Conductor

- 3.1. Strength: As specified in section 6.
- 3.2. Stranding: Conductor shall be stranded in accordance with ASTM B8.
- 3.3. Temper: As specified in section 6.

4. TECHNICAL DATA

Upon request, Manufacturer shall supply complete Certified Test Reports, Ampacity, SAG/Tension charts and splicing instructions for each size or type of conductor Manufacturer supplies. Manufacturer may also be required to supply the results of any tests under applicable standards.

5. SHIPPING

- 5.1. Standard packages are to be in nominal lengths with reels marked to show length per reel. The overall width of reels with the designation on NR 66.28 shall not exceed 34 inches and shall have a minimum of 6,000 feet of conductor on each reel.
- 5.2. Reels shall be supplied meeting or exceeding the minimum requirements of WC53. Returnable reels are to be metal only. Minimum Arbor hole of 3-1/16" shall be supplied. Reels in excess of 10,000 pounds gross weight shall have their arbor holes reinforced to prevent them from going out of round. Reels that do not meet "Reel Designation" for individual conductor will be rejected. Conductor shall be furnished in one continuous length per coil or reel.
- 5.3. Coils and reels are to conform to the packaging recommendations of JEA requirements.
- 5.4. Coils shall have an inside diameter between 20-24 inches.
- 5.5. Reels, when not specified, shall be non returnable (NR).

6. SPECIFIC REQUIREMENTS

Sizes and type shown below with standard packing quantity.

JEA ITEM ID	SIZE	STRANDS	TYPE	PACKAGING QUANTITY	REEL	STRENGTH	WT PER M/FT
COB CO 025	6	SOLID	SD	50 LB COIL		762#	79.44
COB CO 026	6	SOLID	HD	1,000 LBS	NR31.19	1280#	79.44
COB CO 028	4	SOLID	SD	50 LB COIL		1213#	126.3
COB CO 029	2	SOLID	HD	25 LB COIL		3002#	200.9
COB CO 031	1/0	7	MHD	1,720 LBS	NR36.22	3800#	325.8
COB CO 032	4/0	7	MHD	3,449 LBS	NR42.24	7000#	653.3
COB CO 033	4/0	7	SD	3,449 LBS	NR42.24	6000#	643.3
COB CO 035	300 KCM	37	SD	3,475 LBS	NR42.24	8500#	926.3
COB CO 037	400 KCM	37	MHD	2000-2500 LBS	NR42.24	18000#	1235
COB CO 038	500 KCM	19	HD	3,090 LBS	NR42.24	10000#	1544
COB CO 039	500 KCM	37	MHD	3,088 LBS	NR42.24	21950#	1544
COB CO 040	750 KCM	61	MHD	2000-2500 LBS	NR38.22	30000#	2316

7. TESTING

- 7.1. The completed cable shall meet or exceed all applicable test and requirements as outlined by the standards.
- 7.2. JEA reserves the right to subject any item, purchased from this bid, to recognized test procedures by an independent laboratory. Any material failing such tests shall be replaced at supplier's expense.
- 7.3. Certified test reports shall be furnished on all cables shipped. The report shall include the master reel numbers, JEA item ID, purchase order number, shipping reel number(s) and the actual test results compared to the required values.
- 7.4. Send the Certified Test Reports to:

JEA Distribution Standards Supervisor
21 West Church Street, Tower 5
Jacksonville, Florida 32202

8. APPROVED MANUFACTURERS

Listed below are the current approved cable manufacturers:

Cable Corp.	Alcatel Wire & Cable	Rome
Service Wire	Hi-Tech Cable Corp.	Southwire
Cablec (BICC)	Phillips Cables	Nehring
ACPC		

SECTION VI - TECHNICAL SPECIFICATIONS**PART P - COPPERWELD AND COPPERWELD-COPPER CONDUCTOR****1. DESCRIPTION**

Copperweld and Copperweld-copper conductors for bare overhead line construction are particularly well suited for long span lines where high strengths are advantageous.

2. SPECIFICATION

The following conductors shall conform to the latest Industry Standard Specifications:

Copperweld ASTM B227 & B228

Copperweld-copper ASTM B229

3. PACKAGING

3.1. Sizes and standard packing quantities are shown below:

JEA ITEM ID	SIZE	TYPE	STD. PACK. QUANTITY	REEL
COB CW 010	3#8	30EHS	692 LB	NR30.12
COB CW 011	7#10	30EHS	1018 LB	NR32.19
COB CW 012	3#7A	30EHS	874 LB	NR32.19
COB CW 013	3#6	30EHS	1100 LB	NR32.19
COB CW 014	4	DSA	50 LB. COIL	
COB CW 015	19STR#8	40EHS		
COB CW 016	7STR#5	40EHS		

3.2. Coils shall have an inside diameter between 20-24 inches.

3.3. Reel dimensions shall not exceed 66 inches in diameter and 34 inches in overall width.

4. APPROVED MANUFACTURERS

Listed below are the current approved cable manufacturers:

Copperweld Bimetallic Group

Service Wire

SECTION VI - TECHNICAL SPECIFICATIONS**PART E - ALUMINUM CONDUCTOR, STEEL REINFORCED (ACSR)****1. DESCRIPTION**

Bare aluminum conductors with a reinforcing steel core will be used for overhead lines with moderate to long spans where high strength conductor is required. The conductor shall be a composite concentric-lay-stranded cable in which the central portion is coated high strength steel, which may be a single strand of wire or a stranded cable of steel wires and the outer portion is one or more layers of 1350-H19 Aluminum wires.

2. APPLICABLE STANDARDS

- 2.1. Physical and electrical characteristics of material supplied under this specification shall meet or exceed the following latest ASTM, AEIC, EEI, NEMA and ICEA specifications and/or testing procedures.
- 2.2. The following specific standards shall apply:
 - ASTM B232 Concentric-lay-stranded ACSR
 - ASTM B230 1350-H19 Aluminum Wire
 - ASTM B498 Galvanized Steel Core Wire
 - ASTM B500 Stranded Galvanized & Aluminized Steel Core
 - WC 53 Packaging Standards for Aluminum and ACSR Conductor
- 2.3. Where a particular product requirement or characteristic is specified in more than one document, the more stringent requirement shall apply.

3. SPECIFICATIONS

ACSR Conductor:

- 3.1. The steel core shall be Class A Galvanized Steel (ACSR/GA).
- 3.2. The values of rated strength shown on the revised method of calculation given in ASTM B232, and all of the latest revisions of these specifications to date.
- 3.3. The 1350 aluminum conductor shall be as listed in Section 6.

4. TECHNICAL DATA

Upon request, Manufacturer shall supply complete Ampacity, SAG/Tension charts and splicing instructions for each size or type of conductor Manufacturer supplies. Manufacturer may also be required to supply the results of any tests under applicable standards.

5. PACKAGING

- 5.1. Reels shall be supplied meeting or exceeding the minimum requirements of WC 53. Returnable reels are to be metal only. Minimum Arbor hole of 3-1/16" shall be supplied. Reels in excess of 10,000 pounds gross weight shall have their arbor holes reinforced to prevent them from going out of round. Reels that do not meet "Reel Designation" for individual conductor will be rejected. Conductor shall be furnished in one continuous length per reel.
- 5.2. Reels are to conform to the Aluminum Association packaging recommendations and JEA regulations.

6. SPECIFIC REQUIREMENTS

JEA	CODE	SIZE(MCM)			WT Per	RATED	REEL (LENGTH)
ITEM ID	WORD	AND STRANDING	TEMPER	Diam.	M FT.	STRENGTH	DESIGNATION
COB SR 001	PARAKEET	556.5 - 24/7	500	.914"	717#	19,800#	RMT 84.36(9140FT)
COB SR 002	CARDINAL	954 - 54/7	730	1.196"	1229#	33,800#	RMT 90.45(9600FT)
COB SR 003	FALCON	1590 - 54/19	1030	1.545"	2044#	54,500#	RMT 90.45(5735FT)

7. TESTING

- 7.1. The completed cable shall meet or exceed all applicable test and requirements as outlined in the standards.
- 7.2. JEA reserves the right to subject any item, purchased from this bid, to recognized test procedures by an independent laboratory. Any material failing such tests shall be replaced at supplier's expense.
- 7.3. Certified test reports shall be furnished on all cables shipped. The report shall include the master reel numbers, JEA item ID, purchase order number, shipping reel number(s) and the actual test results compare to the required values.
- 7.4. Send the Certified Test Reports to:

JEA Distribution Standards Supervisor
 21 West Church Street, Tower 5
 Jacksonville, Florida 32202

8. APPROVED MANUFACTURERS

Listed below are the current approved cable manufacturers:

Alcan	Cablec (BICC)
Alcatel Wire & Cable	Southwire

SECTION VI - TECHNICAL SPECIFICATIONS**PART B- ALL ALUMINUM CONDUCTOR (AAC)****1. DESCRIPTION**

Bare 1350 aluminum conductors suitable for overhead lines of short or moderate spans, where the higher strength of ACSR or aluminum alloy is not required. A concentric-lay-stranded conductor made up of 7, 19, 37, 61 or more wires in 1, 2, 3, 4 or more layers around a central wire, with each successive layer having six more wires than the layer immediately beneath. The aluminum wire shall be made from rod meeting all the requirements of the standard specifications for rolled aluminum rod for electrical purposes.

2. STRANDING CLASS

Stranding to be class A for greater flexibility. The direction of lay of the outer layer is to be standard right-hand.

3. SPECIFICATIONS

Bare 1350 all-aluminum conductor manufactured in accordance with the latest applicable issues of the following Industry specifications:

ASTM B230	EC-H19 Aluminum Wire
ASTM B231	Concentric-lay-stranded 1350 Aluminum Conductor

4. RATED STRENGTH

The values of rated strength shown are based on the revised method of calculation given in ASTM B231 and B400 and all of the latest revisions of these specifications to date.

5. PACKAGING

- 5.1. Standard packages are to be in nominal lengths with reels marked to show length per reel. The overall width of reels with the designation on NR 66.28 shall not exceed 34 inches and shall have a minimum of 6,000 feet of conductor on each reel.
- 5.2. Coils and reels are to conform to the packaging recommendations of JEA requirements.
- 5.3. Coils shall have an inside diameter between 20-24 inches.
- 5.4. Only one length of conductor will be in a coil or on a reel.

JEA ITEM ID	CODE WORD	SIZE AND STRANDING	RATED STRENGTH	REEL (LENGTH) DESIGNATION
COB TW 004 **		#4 AWG-SOLID		25# COIL
COB TW 005 *		#4 AWG-SOLID	369#	25# COIL
COB TW 006 *		#2 AWG-SOLID	586#	25# COIL
COB AA 025	TULIP	336 KCM-19	6,150#	NR 66.28
COB AA 026	ORCHID	636 KCM-37	11,400#	NR 66.28
COB AA 027	GOLDENROD	954 KCM-61	16,900#	RMT90.45(10,900Ft)

* NOTE: Use for Tie Wire (EC Grade, Softdrawn)

**NOTE: Use for Tie Wire (0.045" layer of black thermoplastic rubber, outside diameter 0.30")

6. APPROVED MANUFACTURERS

To see approved manufacturers, refer to online Electric Master Material Catalog.

SECTION VI - TECHNICAL SPECIFICATIONS**PART Q - 600 VOLT BUILDING CONDUCTOR****1. DESCRIPTION**

Type THWN to be used for applications underground, in concrete slabs or other masonry in direct contact with earth, in both wet and dry locations, and where condensation and moisture accumulations within the raceway may occur. For circuits not exceeding 600 volts where the maximum operating temperature shall not exceed 75 °C for THWN.

2. CONDUCTORS

Conductors shall be solid or concentric stranded soft copper.

3. INSULATION

Single conductors are to be insulated with polyvinyl chloride type THWN insulation. Insulation is to be highly resistant to flame, impact and abrasion, also resistant to heat and to oils, alkalis and acids. The insulation is to be free stripping, bright and smooth and supplied in permanent surface-coated colors.

4. MARKING

Type THWN wire shall bear the required Underwriters' Laboratories, Inc. surface marking.

5. PACKAGING

To be supplied in standard packages as follows:

- 5.1. Sizes 14 through 8 AWG, 500' Carton
- 5.2. Sizes 6 through 2 AWG, 500' Coil
- 5.3. Sizes 1 AWG and larger, 1000' Reel

6. SPECIFICATIONS

ITEM ID COI BW	SIZE AWG	NO. STR.	INSUL. COLOR	INSUL. THICK.	O.D. IN.	WT/M FT
001	14	1	BLACK	2/64"	.13	18#
002	14	1	WHITE	2/64"	.13	18#
003	12	1	BLACK	2/64"	.15	27#
004	12	1	RED	2/64"	.15	27#
005	12	1	WHITE	2/64"	.15	27#
006	12	1	GREEN	2/64"	.15	27#
007	12	1	ORANGE	2/64"	.15	27#
008	12	1	BLUE	2/64"	.15	27#
009	12	1	BROWN	2/64"	.15	27#
010	12	1	YELLOW	2/64"	.15	27#
011	10	1	BLACK	2/64"	.17	40#
012	10	1	WHITE	2/64"	.17	40#

013	14	19	BLACK	2/64"	.14	19#
014	14	19	WHITE	2/64"	.14	19#
015	12	19	BLACK	2/64"	.16	28#
016	12	19	WHITE	2/64"	.16	28#
017	10	19	BLACK	2/64"	.18	42#
018	10	19	WHITE	2/64"	.18	42#
026	10	19	GREEN	2/64"	.18	42#
019	8	19	BLACK	3/64"	.24	70#
020	8	19	WHITE	3/64"	.24	70#
021	6	19	BLACK	4/64"	.31	113#
022	6	19	WHITE	4/63"	.31	113#

7. APPROVED MANUFACTURERS

Listed below are the current approved cable manufacturers.

Cablec
Hi-Tech Cable Corp.
Rome
Southwire
Triangle