ADSS Fiber Optic Cable

Single Mode Fiber, Double Jacket

Description

Double Jacket ADSS consists of loose tubes stranded around the non-metal central strength member（FRP）. The cable core wrapped with a water blocking tape. Polyethylene (PE) extruded as inner sheath, and then Kevlar yarns are applied over inner sheath to enhance tensile strength for self-supporting application. The cable is completed with HDPE outer sheath. The loose tube sheathing is made of high modulus plastics (PBT). The individual fibers are secondary coated into the loose tube with suitable excess length and the tube is filled with tube filling compound.

Characteristics

- All dielectric structure, light weight, easy installation, good electromagnetic resistance,
  suitable for operating in the electrical system on towers and poles of high voltage power line to meet the demands of the power sector.
- The cable is ideal for installation in distribution as well as transmission environments; including live-line installations.
- Kevlar, as the main tensile strength member, has the advantages of high Young's modulus, light, minor long-term extension. Its minor negative heat-expansion coefficient improves cable temperature property.
- The amount of Kevlar applied to the cable can be adjusted to obtain the mechanical properties required by the environment (span, sag, ice load, wind speed, etc.).
- No support or messenger wire is required. Installation is achieved in a single pass.
- Precision design and optimum control of excess length of the fibers in the tube to ensure suited strain on the fibers, individually or collectively.

ADSS – 48 B1.3 PE Span 250m

Max Span: 250m Max. Applied voltage: 110kv Sag：1.1%

Max operating weather conditions: 104 km/h wind speed and no ice load

Cable cross-section and dimensions

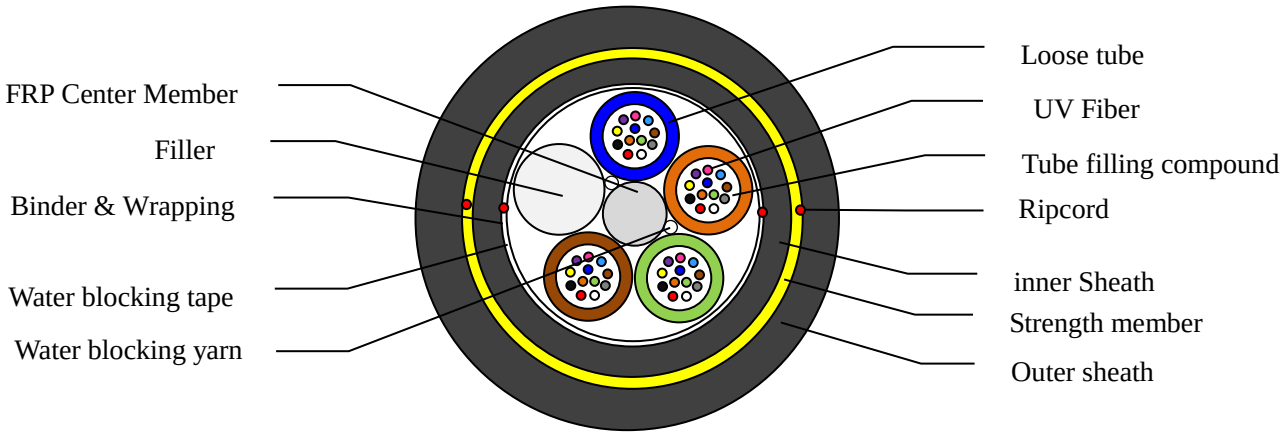


Figure. Cable Cross-Section (A-end)

Item	Material	Description
Outer sheath	HDPE	HDPE
Dielectric Strength Members	Aramide yarns	Additional strength member
Inner sheath	MDPE	MDPE
Binder	Polyester yarn	Cable core binding
Water blocking yarn	Water blocking yarn	Water blocking & moisture proof
Water blocking tape	Water blocking tape	Water blocking & moisture proof
Filler	PP	Diameter same as tube,
Loose tube	PBTP	Colors of tubes: blue, orange,green，brown，EIA/TIA-598B
Tube filling compound	Thyrotrophic gel	Water Blocking & Moisture Proof
Fiber	Silicon-based fiber(G.652D)	UV fiber, color with: blue, orange, green, brown,grey,white,red,black,yellow,purple, pink,aqua，EIA/TIA-598B
Center strength member	FRP	FRP
Cable O.D.	13.6±0.5mm	
Cable weight	133±15kg	

Cable main mechanical properties and application

Serial No.	Item	Requirement
1	MAT	6400N
2	Allowable crush resistance (N)	1000N /10cm
3	Operation temperature	-40 ºC +70 ºC
4	Lifespan	20 years

ADSS – 48 B1.3 PE Span 600m

Max Span: 600m Max. Applied voltage: 110kv Sag:2.3%

Max operating weather conditions: 104 km/h wind speed and no ice load

Cable cross-section and dimensions

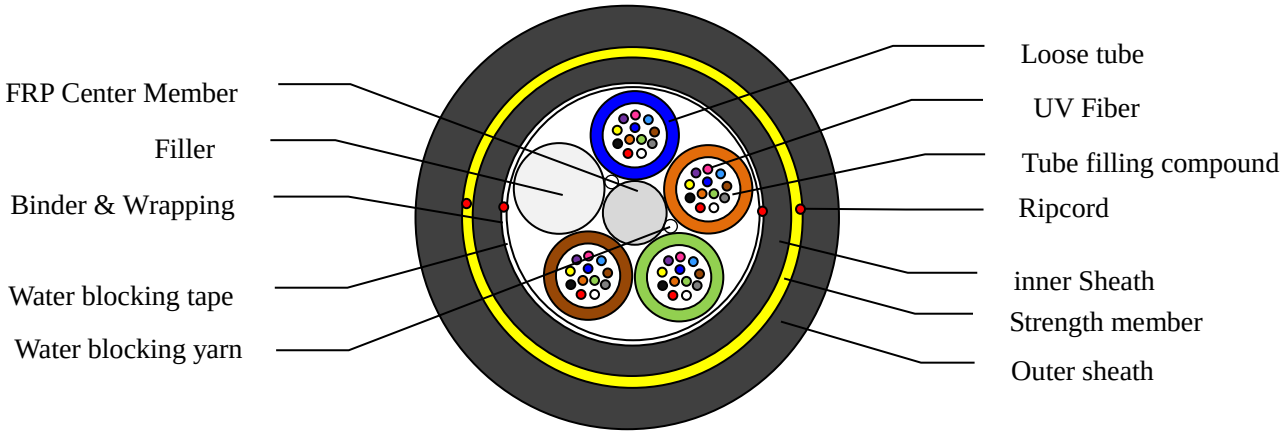


Figure. Cable Cross-Section (A-end)

Item	Material	Description
Outer sheath	HDPE	HDPE
Dielectric Strength Members	Aramide yarns	Additional strength member
Inner sheath	MDPE	MDPE
Binder	Polyester yarn	Cable core binding
Water blocking yarn	Water blocking yarn	Water blocking & moisture proof
Water blocking tape	Water blocking tape	Water blocking & moisture proof
Filler	PP	Diameter same as tube,
Loose tube	PBTP	Colors of tubes: blue, orange,green，brown，EIA/TIA-598B
Tube filling compound	Thyrotrophic gel	Water Blocking & Moisture Proof
Fiber	Silicon-based fiber(G.652D)	UV fiber, color with: blue, orange, green, brown,grey,white,red,black,yellow,purple, pink,aqua，EIA/TIA-598B
Center strength member	FRP	FRP
Cable O.D.	13.9±0.5mm	
Cable weight	141±15kg	

Cable main mechanical properties and application

Serial No.	Item	Requirement
1	MAT	11300N
2	Allowable crush resistance (N)	1000N /10cm
3	Operation temperature	-40 ºC +70 ºC
4	Lifespan	20 years

ADSS – 48 B1.3 PE Span 1200m

Max Span: 1200m Max. Applied voltage: 110kv Sag:3.5%

Max operating weather conditions: 104 km/h wind speed and no ice load

Cable cross-section and dimensions

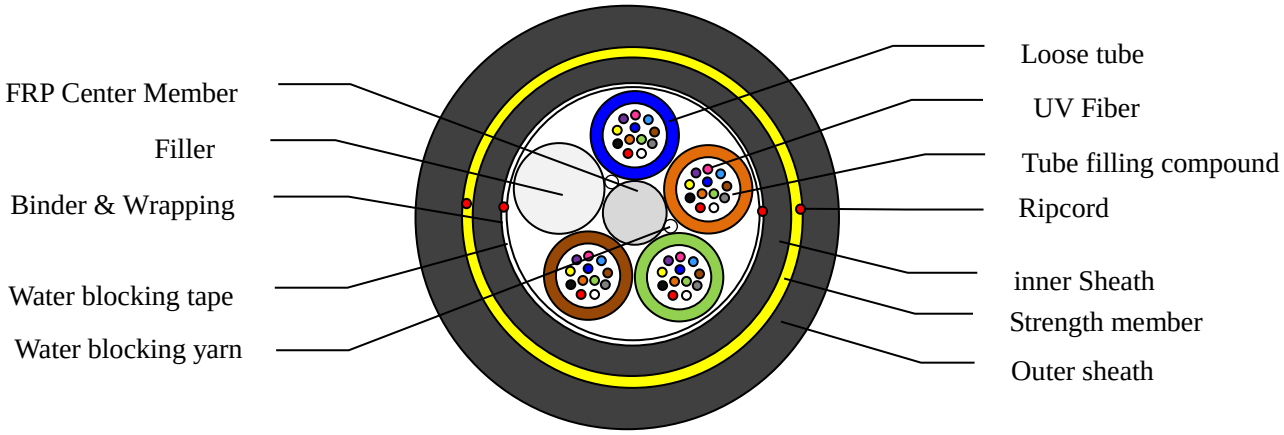


Figure. Cable Cross-Section (A-end)

Item	Material	Description
Outer sheath	HDPE	HDPE
Dielectric Strength Members	Aramide yarns	Additional strength member
Inner sheath	MDPE	MDPE
Binder	Polyester yarn	Cable core binding
Water blocking yarn	Water blocking yarn	Water blocking & moisture proof
Water blocking tape	Water blocking tape	Water blocking & moisture proof
Filler	PP	Diameter same as tube,
Loose tube	PBTP	Colors of tubes: blue, orange,green，brown，EIA/TIA-598B
Tube filling compound	Thyrotrophic gel	Water Blocking & Moisture Proof
Fiber	Silicon-based fiber(G.652D)	UV fiber, color with: blue, orange, green, brown,grey,white,red,black,yellow,purple, pink,aqua，EIA/TIA-598B
Center strength member	FRP	FRP
Cable O.D.	15.4±0.5mm	
Cable weight	172±15kg	

Cable main mechanical properties and application

Serial No.	Item	Requirement
1	MAT	21400N
2	Allowable crush resistance (N)	1000N /10cm
3	Operation temperature	-40 ºC +70 ºC
4	Lifespan	20 years

ADSS – 48 B1.3 PE Span 600m

Max Span: 600m Max. Applied voltage: 110kv Sag:2.3%

Max operating weather conditions: 90 km/h wind speed and 10mm ice load

Cable cross-section and dimensions

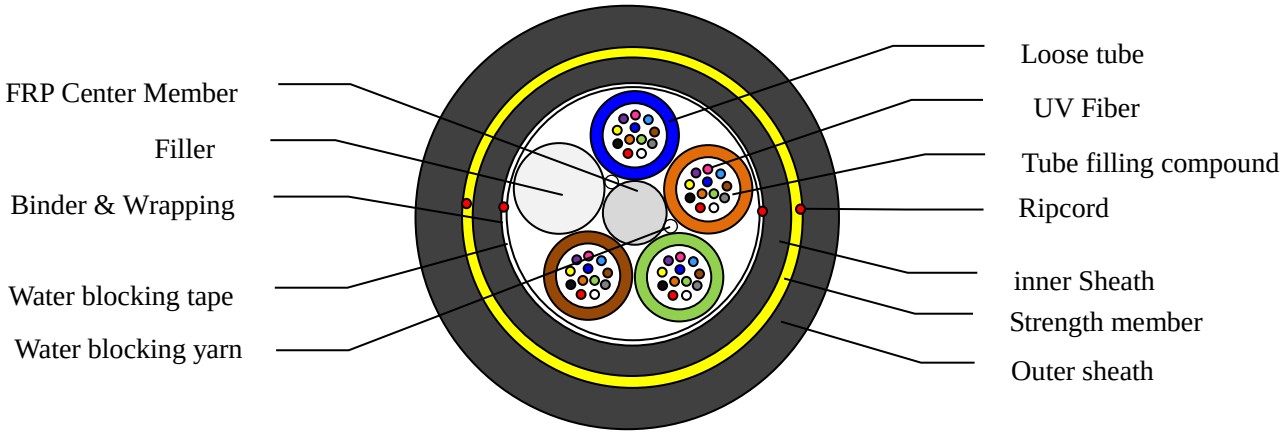


Figure. Cable Cross-Section (A-end)

Item	Material	Description
Outer sheath	HDPE	HDPE
Dielectric Strength Members	Aramide yarns	Additional strength member
Inner sheath	MDPE	MDPE
Binder	Polyester yarn	Cable core binding
Water blocking yarn	Water blocking yarn	Water blocking & moisture proof
Water blocking tape	Water blocking tape	Water blocking & moisture proof
Filler	PP	Diameter same as tube,
Loose tube	PBTP	Colors of tubes: blue, orange,green，brown，EIA/TIA-598B
Tube filling compound	Thyrotrophic gel	Water Blocking & Moisture Proof
Fiber	Silicon-based fiber(G.652D)	UV fiber, color with: blue, orange, green, brown,grey,white,red,black,yellow,purple, pink,aqua，EIA/TIA-598B
Center strength member	FRP	FRP
Cable O.D.	14.8±0.5mm	
Cable weight	160±15kg	

Cable main mechanical properties and application

Serial No.	Item	Requirement
1	MAT	21500N
2	Allowable crush resistance (N)	1000N /10cm
3	Operation temperature	-40 ºC +70 ºC
4	Lifespan	20 years

ADSS – 48 B1.3 PE Span 1000m

Max Span: 1000m Max. Applied voltage: 110kv Sag:3.0%

Max operating weather conditions: 90 km/h wind speed and 10mm ice load

Cable cross-section and dimensions

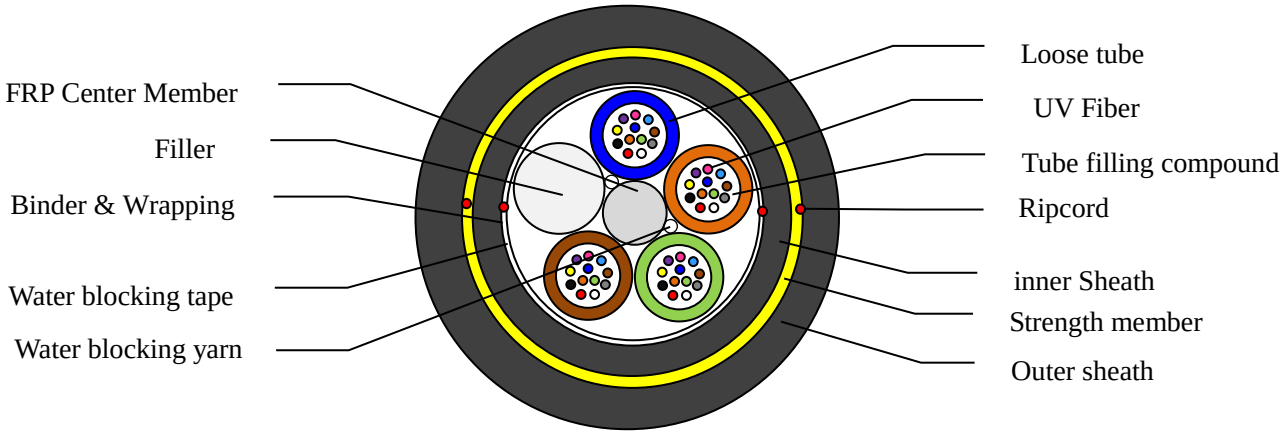


Figure. Cable Cross-Section (A-end)

Item	Material	Description
Outer sheath	HDPE	HDPE
Dielectric Strength Members	Aramide yarns	Additional strength member
Inner sheath	MDPE	MDPE
Binder	Polyester yarn	Cable core binding
Water blocking yarn	Water blocking yarn	Water blocking & moisture proof
Water blocking tape	Water blocking tape	Water blocking & moisture proof
Filler	PP	Diameter same as tube,
Loose tube	PBTP	Colors of tubes: blue, orange,green，brown，EIA/TIA-598B
Tube filling compound	Thyrotrophic gel	Water Blocking & Moisture Proof
Fiber	Silicon-based fiber(G.652D)	UV fiber, color with: blue, orange, green, brown,grey,white,red,black,yellow,purple, pink,aqua，EIA/TIA-598B
Center strength member	FRP	FRP
Cable O.D.	16.6±0.5mm	
Cable weight	195±15kg	

Cable main mechanical properties and application

Serial No.	Item	Requirement
1	MAT	36100N
2	Allowable crush resistance (N)	1000N /10cm
3	Operation temperature	-40 ºC +70 ºC
4	Lifespan	20 years

DETAILED SPECIFICATIONS –ADSS-48

1. General

1.1 This specification covers the requirements for the supply of dry core, single-mode optical fiber cables.

1.2 This single mode optical fiber cable shall comply with the requirements of this specification and ITU-T G652D.

2. Fiber characteristics

The optical, geometrical, mechanical and environmental performance of the optical fiber shall be in accordance with tables 2.1.

Table 2.1 G652D fiber characteristics

G.652D fiber characteristics		
Optics specifications		
Attenuation	@1310nm	≤0.35dB/km
	@1550nm	≤0.20dB/km
Dispersion	@1285nm～1340nm	-3.0ps/(nm·km)～3.0ps/(nm·km)
	@1550nm	≤18ps/(nm·km)
	@1625nm	≤22ps/(nm·km)
Zero-Dispersion wavelength		1300nm～1324nm
Zero-Dispersion slope		≤0.092ps/(nm^2·km)
Mode field diameter (MFD) at 1310nm		9.2±0.4μm
Mode field diameter (MFD) at 1550nm		10.4±0.5μm
PMD	Max. for fiber on the reel	0.20ps/km$^{1/2}$
	Max. for link designed value	0.10ps/km$^{1/2}$
Cable cutoff wavelength λ_{cc}(nm)		≤1260nm
Back scatter characteristics (at 1310nm&1550nm)		
Point discontinuity		≤0.05dB
Attenuation uniformity		≤0.05dB/km
Attenuation coefficient difference for bi-directional measurement		≤0.05dB/km
Geometrical characteristics		
Cladding diameter		125±1.0μm
Cladding non-circularity		≤0.7%
Core/cladding concentricity error		≤0.5μm
Fiber diameter with coating (uncolored)		245±10μm

Cladding/coating concentricity error		≤12.0μm
Mechanical characteristics		
Proof stress		≥0.69GPa(kpsi)
Macrobend loss at 1550nm	Φ60mm, 100turns	≤0.05dB
	Φ32mm,1turn	≤0.05dB
Environmental characteristics (at 1310nm & 1550nm)		
Temperature induced attenuation(-60~+85℃)		≤0.05dB/km
Dry heat induced attenuation (85℃±2℃, 30 days)		≤0.05dB/km
Water immersion induced attenuation (23℃±2℃, 30 days)		≤0.05dB/km
Damp heat induced attenuation (85℃±2℃, RH85%, 30 days)		≤0.05dB/km

3 PHYSICAL, MECHANICAL, ENVIRONMENTAL, PERFORMANCE AND TESTS

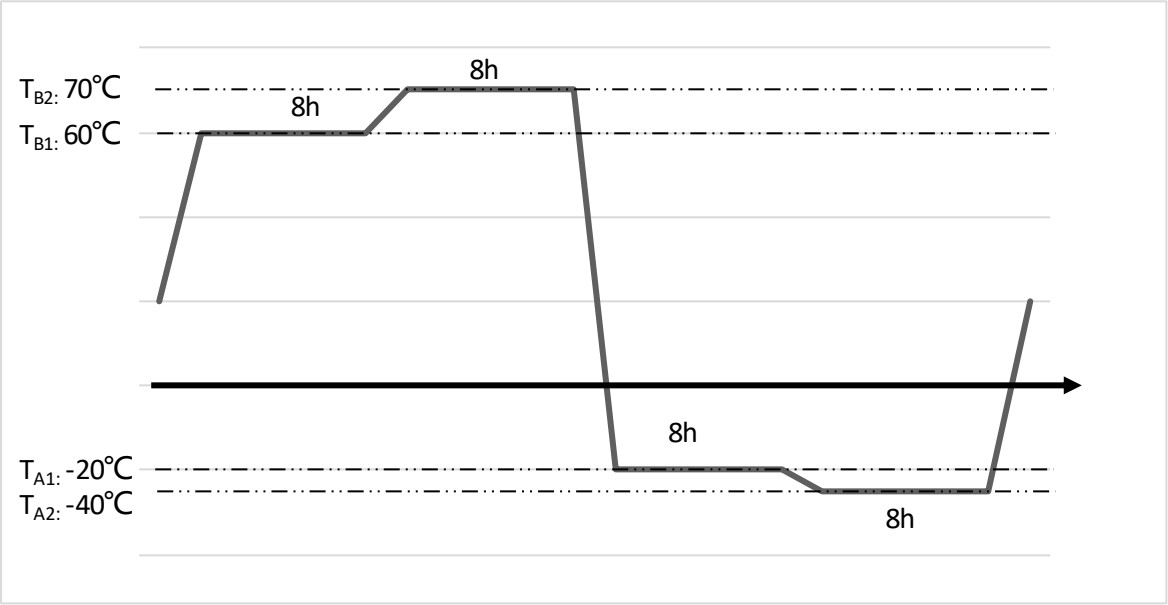
3.1 Mechanical and Environmental Performance of the Cable

The mechanical and environmental performance of the cable shall be in accordance with Table
3.1 below. Unless otherwise specified, all attenuation measurements required in this section shall be performed at 1550nm for single mode fiber.

Table 3.1 The Mechanical and Environmental Performance of the Cable

Item	Test Method	Test Conditions	Acceptance Criteria
Tensile Strength	IEC60794-1-2- E1	L ≥ 50 m Load: MAT of each cable. Time: 1min	Additional attenuation≤0.05dB Fiber strain elongation ≤0.33% No visible damage to the surface of out sheath
Crush Resistance	IEC60794-1-2- E3	Load：1000N Time: 10 minute Length: 100 mm	Additional attenuation≤0.05dB No visible damage to the surface of out sheath
Impact Resistance	IEC60794-1-2- E4	The impact of weight: 4.4N Weight high: 1m 3 point , 5 times per point	Additional attenuation≤0.05dB No visible damage to the surface of out sheath
Repeated bending	IEC60794-1-2- E6	Load: 150 N Minimum radius of curvature R=15D，better than 20D which is required by IEC60794-1-21-E6； Tests = 30 cycles Each cycle ≈ 2 sec. L =1.0 m	Additional attenuation≤0.05dB No visible damage to the surface of out sheath

Item	Test Method	Test Conditions	Acceptance Criteria
Torsion	IEC60794-1-2- E7	The test length =1m, ±180 degree, 10 cycles, Test weight 150N	Additional attenuation≤0.05dB No visible damage to the surface of out sheath
Temperature cycling	IEC60794-1-22- F1	Temperature 2:-40 ºC to +70 º Temperature1: -20 ºC to 60 º Time of permanence:8h Cycle:2 Cable length: ≥ 1000 m	Additional attenuation during the test(At 1310nm and 1550nm): T_{A1} to T_{B1}≤0.05 dB/km T_{A1} to T_{A2} and T_{B1} to T_{B2}≤0.15dB/km Additional attenuation after test: T_{A1} to T_{A2} and T_{B1} to T_{B2}≤0.05 dB/km （IEC60794-4-20）



Water penetration Test	IEC60794-1-2-F5	At 20±5℃,1m water column applied to one of 3m cable after 24h,no water penetration	No water penetration

3.2 Operating Condition

Item		Performance
Temperature （IEC60794-4-20）	Installation	-40℃ to +70℃
	Operation	-40℃ to +70℃
	Transportation and storage	-40℃ to +70℃

4.Marking and Coil

4.1 Marking of the cover

The following information will be marked in low relief, legible, along the surface of its outer cover, at intervals of one (1) meter of white color. The information includes:

1. FITEL-MTC;
2. The name of the manufacturer;
3. Month and year of manufacture;
4. The type of cable, which includes: fiber type, number of fibers, span;
5. Sequential marks in meters;

4.2 The coil

4.2.1 The standard length of the cables should be 6,000 meters per each. Other cable lengths are also available if requested by the customer.

4.2.2 Both ends of the cable must be sealed with plastic plugs to prevent moisture during transportation, handling and storage.

4.2.3 All ends of the cables must be firmly fixed to prevent the cable from being released during transport or during installation operations.

4.3 Marking the coil

4.3.1 The details below will be clearly marked with a weather resistant material on both sides of the coils:

1) Buyer's name

2) the number of coils
3) Name of the manufacturer
4) Year of manufacture
5) Direction of coil rotation

4.3.2 Another brand is also available if requested by the customer.

4.3.3 The cable must be sent by the reels designed to avoid damage during transportation and installation.

4.3.4 The arbor holes provided on the reels should be approximately 105 mm.

5.Technologies Parameters

Cable type	Modulo elasticidad (Kgf/mm2)	Coeficiente de dilatacion lineal (1/℃)	Carga Rotura (kg)
ADSS span 250m aera 1	508.80	0.00000501	1276.36
ADSS span 600m aera 1	794.94	0.00000233	2266.50
ADSS span 1200m aera 1	1168.68	0.00000060	4297.57
ADSS span 600m aera 2	1270.85	0.00000045	4322.95
ADSS span 1000m aera 2	1635.67	-0.00000039	7217.22