Version **ADSS-V1.2**

Optical Fiber Cable Technical Specification

Aerial Cable

ADSS-PE-Xm-48B1.3
ADSS-AT-Xm-48B1.3

Yangtze Optical Fiber and Cable Joint Stock Limited Company

Customer Approval			
	Name	**Signature**	**Date**
Approved by			**2019/10/24**

1. General

1.1 Scope

This Specification covers the design requirements and performance standard for the supply of optical fiber cable in the industry. YOFC ensures a stable quality control system for our cable products through several programs including ISO 9001, ISO 14001 and OHS.

Cable type	Application
ADSS-PE-Xm-48B1.3 ADSS-AT-Xm-48B1.3	Self-supporting aerial installation

Xm represents the span.

1.2 Reference

The cable offered by YOFC are designed, manufactured and tested according to the standards as follows:

ITU-T G.652	Characteristics of a single-mode optical fiber
IEC 60794-1-1	Optical fiber cables-part 1-1: Generic specification-General
IEC 60794-1-2	Optical fiber cables-part 1-2: Generic specification-Basic optical cable test procedure
IEC 60794-3	Optical fiber cables-part 3: Sectional specification-Outdoor cables
IEC 60794-4-20	Aerial optical cables along electrical power lines – Family specification for ADSS (All Dielectric Self Supported) optical cables

1.3 Life Time

Optical fiber cables supplied in compliance with this specifications is capable to withstand the typical service condition for a period of twenty-five (25) years without detriment to the operation characteristics of the cable.

1.4 Application

Item	Value
Max. pole distance	200/300/600/1000/1200/1500/1800 m
Operation temperature	-40 ºC～+70 ºC
Storage temperature	-40 ºC～+70 ºC
Static bending radius	10 times the cable diameter
Dynamic bending radius	20 times the cable diameter

2. Optical Fiber

Optical Fibers supplied in this specification meet the requirements of ITU-T G.652.D

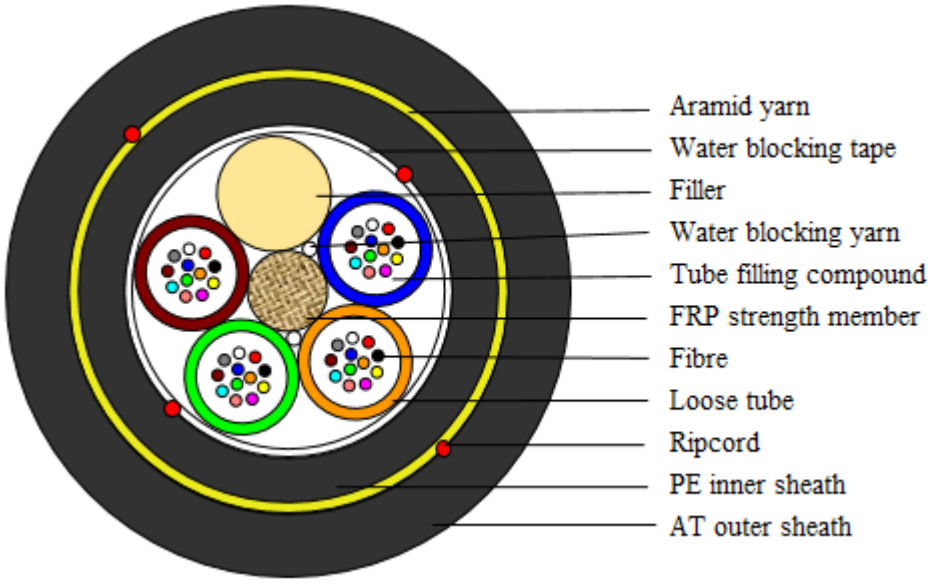
Parameter	Specification
MFD (1310nm)	9.1±0.4um
MFD (1550nm)	10.4±0.5um
Cladding diameter	125mm ±1.0mm
Fiber diameter	245±7um, with UV coating, and colored to : 250±15um
Core/cladding concentricity error	≤ 0.6um
Coating/cladding concentricity error	≤ 12.0um
Cladding non circularity	≤ 1.0%
Cut off wavelength	λcc ≤1260nm
Attenuation coefficient	1310nm: 0.35dB/km max after cabling 1550nm: 0.21dB/km max after cabling
Bending-loss performance of optical fiber @1310nm&1550nm	≤0.05dB (100 turns around a mandrel of 50mm diameter)
Polarization mode dispersion maximum individual fiber	≤0.2ps/√km
Polarization mode dispersion link value	≤0.1ps/√km
Zero-dispersion wavelength	1312±12nm
Zero-dispersion slope	≤0.091ps/nm^2·km

3. Optical Cable

3.1 Technical Characteristics

- The unique second coating and stranding technology provide the fibers with enough space and bending endurance, which ensure good optical property of the fibers in the cable
- Accurate process control ensures good mechanical and temperature performance
- High quality raw material guarantees the long service life of cable

3.2 Cross Section of Cable



ADSS-AT-600m-48B1.3
Structure of other fiber counts refer to 3.4
Schematic for reference only

3.3 Fiber and Loose Tube Identification

The color code of fibers and loose tube will be identification in accordance with the following color sequence, other sequence also is available.

Color Code	1	2	3	4	5	6
	Blue	Orange	Green	Brown	Grey	White
	7	8	9	10	11	12
	Red	Black	Yellow	Violet	Pink	Aqua

The color of the fillers will be natural.

According ANSI/EIA/TIA 598, Code of colors of the optical cable.

3.4 Dimensions and Descriptions

The standard optical cable structure is shown in the following table, other structure and fiber count are also available according to customer requirements.

ÁREA 0											
Item	**Contents**	**Value**									
		48									
Span	Length (m)	**200**	**300**	**600**	**1000**	**1200**	**1500**	**1800**	**300**	**600**	**1000**	**1200**
Structure	Type	1+5										
Loose tube	Fiber count/tube	12										
	Outer diameter (mm)	2.4				2.6			2.4			2.6
Central strength member	Material	FRP										
	Diameter (mm)	1.8				2.4			1.8			2.4
Water Blocking Material	Material	Water blocking yarn and tape										
Inner sheath	Material	PE										
	Color	Black										
	Thickness (mm) Nominal	0.8				1			0.8			1
Peripheral strength member	Material	Aramid yarn										
Ripcord	Number	2+2										
	Color	Red										
Outer sheath	Color	Black										
	Material	PE							AT			
	Thickness (mm)	1.7				2			1.7			2
	Nominal											
Cable diameter (±0.5mm)		12.4	12.8	13.5	14.2	16.6	17.2	18.8	12.9	13.5	14.2	16.6
Cable weight (kg/km) Approx.		115	120	140	155	205	210	230	130	145	160	210
Modulus of elasticity (GPa)		5.08	6.65	11.05	15.34	13.37	15.06	16.44	7.47	11.05	15.34	13.37
Coefficient of linear expansion(ppm/K)		2.90	1.30	-0.60	-1.30	-0.90	-1.20	-1.50	0.80	-0.60	-1.30	-0.90

ÁREA 1													
Item	**Contents**	**Value**											
		48											
Span	Length (m)	**200**	**300**	**600**	**1000**	**1200**	**1500**	**1800**	**300**	**600**	**1000**	**1200**	**1800**
Structure	Type	1+5											
Loose tube	Fiber count/tube	12											
	Outer diameter (mm)	2.4				2.6			2.4			2.6	
Central strength member	Material	FRP											
	Diameter (mm)	1.8				2.4			1.8			2.4	
Water Blocking Material	Material	Water blocking yarn and tape											
Inner sheath	Material	PE							AT				
	Color	Black											
	Thickness (mm) Nominal	0.8			1				0.8		1		
Peripheral strength member	Material	Aramid yarn											
Ripcord	Number	2+2											
	Color	Red											
Outer sheath	Color	Black											
	Material	PE							AT				
	Thickness (mm) Nominal	1.7			2				1.7		2		
Cable diameter (±0.5mm)		12.4	12.8	13.4	15	16.2	16.8	18.8	12.8	13.4	15	16.2	18.8
Cable weight (kg/km) Approx.		115	120	135	175	195	205	230	125	140	180	205	235
Modulus of elasticity (GPa)		5.08	6.65	10.36	13.06	11.69	14.15	16.44	6.65	10.36	13.06	11.69	16.44
Coefficient of linear expansion(ppm/K)		2.90	1.30	-0.40	-1.00	-0.50	-1.10	-1.50	1.30	-0.40	-1.00	-0.50	-1.50

ÁREA 2										
Item	**Contents**	**Value**								
		48								
Span	Length (m)	**200**	**300**	**600**	**1000**	**1500**	**600**	**1000**	**1200**	**1500**
Structure	Type	1+5								
Loose tube	Fiber count/tube	12								
	Outer diameter (mm)	2.4		2.6						
Central strength member	Material	FRP								
	Diameter (mm)	1.8		2.4						
Water Blocking Material	Material	Water blocking yarn and tape								
Inner sheath	Material	PE								
	Color	Black								
	Thickness (mm) Nominal	0.8		1						
Peripheral strength member	Material	Aramid yarn								
Ripcord	Number	2+2								
	Color	Red								
Outer sheath	Color	Black								
	Material	PE					AT			
	Thickness (mm) Nominal	1.7		2						
Cable diameter (±0.5mm)		13	13.4	16.5	17.6	18.8	16.5	17.6	18.8	18.8
Cable weight (kg/km) Approx.		125	130	190	215	230	203	228	235	235
Modulus of elasticity (GPa)		8.27	10.36	10.87	16.32	16.44	10.87	16.32	16.44	16.44
Coefficient of linear expansion(ppm/K)		0.40	-0.40	-0.50	-1.40	-1.50	-0.50	-1.40	-1.50	-1.50

ÁREA 3					
Item	**Contents**	**Value**			
		48			
Span	Length (m)	**200**	**300**	**600**	**600**
Structure	Type	1+5			
Loose tube	Fiber count/tube	12			
	Outer diameter (mm)	2.4	2.6	2.6	2.6
Central strength member	Material	FRP			
	Diameter (mm)	1.8	2.4	2.4	2.4
Water Blocking Material	Material	Water blocking yarn and tape			
Inner sheath	Material	PE			
	Color	Black			
	Thickness (mm) Nominal	0.8	1.0		
Peripheral strength member	Material	Aramid yarn			
Ripcord	Number	2+2			
	Color	Red			
Outer sheath	Color	Black			
	Material	PE			AT
	Thickness (mm) Nominal	1.7	2.0		
Cable diameter (±0.5mm)		13.9	17.2	19.4	19.4
Cable weight (kg/km) Approx.		145	206	253	267
Modulus of elasticity (GPa)		13.61	14.01	19.16	19.16
Coefficient of linear expansion(ppm/K)		-1.10	-1.10	-1.80	-1.80

3.5 Main Mechanical and Environmental Performance

span (m)	Initial Installation sag	Loading zone	RTS (kN)	MAT (kN)	EDS (kN)	Crush (N/100mm)	voltage
200-PE	≥ 1.0%	Área 0	7.5	4.0	1.8	3000	≤12kV
	≥ 1.0%	Área 1	7.5	3.6	1.8	3000	≤12kV
	≥ 1.0%	Área 2	14.5	8.0	3.6	3000	≤12kV
	≥ 1.0%	Área3	28.0	16.0	7.0	3000	≤12kV
300-PE	≥ 1.25%	Área 0	11.0	6.0	2.7	3000	≤12kV
	≥ 1.25%	Área 1	11.0	6.0	2.7	3000	≤12kV
	≥ 1.25%	Área 2	19.5	11.2	4.8	3000	≤12kV
	≥ 2.0%	Área 3	52.0	43.7	13.0	3000	≤12kV
600-PE	≥2.0%	Área 0	21.3	12.0	5.2	3000	≤12kV
	≥2.0%	Área 1	19.6	10.0	4.9	3000	≤12kV
	≥2.0%	Área 2	32.0	20.0	8.0	3000	≤12kV
	≥2.5%	Área 3	74.8	46.5	18.5	3000	≤12kV
1000-PE	≥3.0%	Área 0	33.2	19.0	8.3	3000	≤12kV
	≥3.0%	Área 1	31.5	17.0	7.8	3000	≤12kV
	≥3.0%	Área 2	49.0	30.1	12.2	3000	≤12kV
1200-PE	≥3.0%	Área 0	41.0	24.0	10.2	3000	≤12kV
	≥3.0%	Área 1	34.0	20.0	8.5	3000	≤12kV
1500-PE	≥3.0%	Área 0	49.7	29.0	12.4	3000	≤12kV
	≥3.0%	Área 1	44.5	24.0	11.1	3000	≤12kV
	≥3.0%	Área 2	70.4	39.4	17.6	3000	≤12kV
1800-PE	≥4.0%	Área 0	70.7	39.9	17.7	3000	≤12kV
	≥4.0%	Área 1	70.7	39.9	17.7	3000	≤12kV
300-AT	≥ 1.25%	Área 0	12.8	7.0	3.2	3000	≤25kV
	≥1.25%	Área1	11.0	6.0	2.7	3000	≤25kV
600-AT	≥2.0%	Área 0	21.3	12.0	5.2	3000	≤25kV
	≥2.0%	Área 1	19.6	10.0	4.9	3000	≤25kV
	≥2.0%	Área2	32.3	20.0	8.0	3000	≤25kV
	≥2.5%	Área3	74.8	46.5	18.6	3000	≤25kV
1000-AT	≥3.0%	Área 0	33.2	19.0	8.3	3000	≤25kV
	≥3.0%	Área 1	31.5	17.0	7.8	3000	≤25kV
	≥3.0%	Área 2	49.3	30.1	12.3	3000	≤25kV
1200-AT	≥3.0%	Área 0	41.0	24.0	10.2	3000	≤25kV
	≥3.0%	Área 1	34.0	20.0	8.5	3000	≤25kV
	≥3.0%	Área 2	70.7	33.5	17.7	3000	≤25kV
1500-AT	≥4.0%	Área 2	70.4	39.4	17.6	3000	≤25kV
1800-AT	≥4.0%	Área 1	70.7	39.9	17.7	3000	≤25kV

Environmental condition

Loading zone		Área 0	Área 1	Área 2	Área 3
If only wind	Wind speed	26 m/s	29 m/s	31.5 m/s	33.5 m/s
	Temperature	10 ºC	5 ºC	0 ºC	0 ºC
If only ice	Ice thickness	-	6 mm	25 mm	50 mm
	Temperature	0 ºC	0 ºC	-5 ºC	-5 ºC
Combined event ice and wind	Wind speed	14 m/s	14.5m/s	15.5 m/s	17 m/s
	Ice thickness	-	3 mm	12 mm	25 mm
	Temperature	5ºC	0 ºC	-5 ºC	-5 ºC

4. Mechanical, Physical and Environmental Test Characteristics

The mechanical and environmental performance of the cable are in accordance with the following table. Unless otherwise specified, all attenuation measurements required in this section shall be performed at 1550nm.

Items	Test Method	Requirements
Tension	**IEC 60794-1-2-E1** Load: According to 3.5 Sample length: Not less than 50m. Duration time: 1min.	Additional attenuation: ≤0.05dB after test No damage to outer jacket and inner elements
Crush	**IEC 60794-1-2-E3** Load: According to 3.5 Duration of load: 1min	Additional attenuation: ≤0.05dB after test No damage to outer jacket and inner elements
Impact	**IEC 60794-1-2-E4** Radius: 300 mm Impact energy: 10 J Impact number: 1 Impact points: 3	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Repeated bending	**IEC 60794-1-2-E6** Bending radius: 20*D Cycles: 25 Load: 150N	Additional attenuation: ≤0.05dB No damage to outer jacket and inner elements
Torsion	**IEC 60794-1-2-E7** Cycles:10 Length under test: 1m Turns: ± 180° Load: 150N	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Water Penetration	**IEC 60794-1-2-F5B** Time : 24 hours Sample length : 3m Water height : 1m	No water leakage.
Temperature cycling	**IEC 60794-1-2-F1** Sample length: at least 1000m Temperature range: -40 ºC ~+70 ºC Cycles: 2 Temperature cycling test dwell time: 12 hours	The change in attenuation coefficient shall be less than 0.05 dB/km.
Maximum Instalation Tension	**IEC 60794-4-20** Optical fiber cables – Part 4-20: Aerial optical cables along electrical power lines – Family specification for ADSS (All Dielectric Self Supported) optical cables.	
Other parameters	**IEC 60794-1**	

5. Packaging and Drum

5.1 Cable Sheath Marking

Unless otherwise specified, the cable sheath marking shall be as follows:

- Color: white
- Contents: YOFC, the year of manufacture, the type of cable, cable number, length marking
- Interval: 1 m

Outer sheath marking legend can be changed according to user's requests.

5.2 Reel Length

Standard reel length: 2/3 km/reel, other length is also available.

5.3 Cable Packing

Both ends of the cable will be sealed with suitable plastic caps to prevent the entry of moisture during shipping, handling and storage. The inner end is available for testing.