AERIAL CABLE

AR-1-2FRPU-PE
120M-xxF-G652D

OPTICAL FIBRE CABLE TECHNICAL SPECIFICATION

1. Scope

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

Cable type	Application
AR-1-2FRPU-PE-120M-xxF-G652D	Self-supporting aerial installation

120 represents the span.
xx represents the fibre count.

1.1 Cable Description

- Optical fibres are housed a mono tube that is made of high-modulus plastic and filled with waterproof compounds.
- Mono tube and FRP are SZ stranded together.
- Water blocking yarns are used in the cable core to prevent it from water ingress.
- Polyethylene outer sheath is extruded around the cable.
- One rip cord is used under the cable sheath to open it.

1.2 Reference

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

ITU-T G.652D	Characteristics of a single-mode optical fibre ARTIC.
IEC 60794-1-1	Optical fibre cables-part 1-1: Generic specification-General.
IEC 60794-1-21	Optical fibre cables-part 1-2: Generic specification-Basic optical cable test procedure - Mechanical test methods.
IEC 60794-1-22	Optical fibre cables-part 1-2: Generic specification-Basic optical cable test procedure - Environmental test methods.
IEC 60794-3	Optical fibre cables-part 3: Sectional specification-Outdoor cables.
IEC 60794-3-20	Optical fiber cables-part 3-20: Outdoor cables-Family specification for optical self-supporting aerial communication cables.

1.3 Life Time

Optical fibre 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

Max. pole distance	120m
Operation temperature	-40 ºC～+70 ºC
Installation temperature	-10 ºC～+50 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 Fibre

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

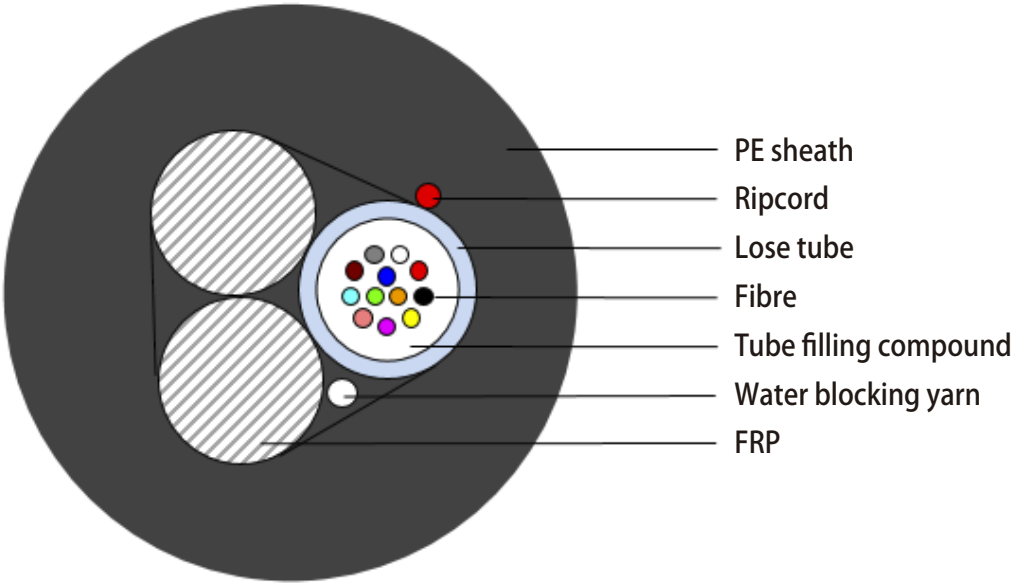
Parameter	Specification
MFD (1310nm)	8.7~9.5um
Cladding diameter	125±1.0um
Fiber diameter	235~255um, with UV coating, and colored to 250±15um
Core/cladding concentricity error	≤ 0.6um
Coating/cladding concentricity error	≤ 12.0um
Cladding non circularity	≤ 1.0 %
Cut off wavelenght	λ cc ≤1260nm
Attenuation coefficient	1310nm: 0.36dB/km 1550nm: 0.22dB/km
Bending-loss performance of optical fiber @1310nm&1550nm	≤0.05dB (100 turns around a mandrel of 50mm diameter)
Polarization mode dispersion maximun individual fibre	≤0.2ps/√km
Polarization mode dispersion link value	≤0.1ps/√km
Zero-dispersion wavelenght	1300~1324nm
Zero-dispersion slope	≤0.092ps/nm2·km

3. Optical Cable

3.1 Technical Characteristics

- The unique second coating and stranding technology provide the fibres with enough space and bending endurance, which ensure good optical property of the fibres 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



3.3 Fibre and Loose Tube Identification

The color code of fibres and loose tube will be identification in accordance with the following color sequence. The color of the tube will be natural.

Fibre 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
	13	14	15	16	17	18
	Blue with black ring	Orange with black ring	Green with black ring	Brown with black ring	Grey with black ring	White with black ring
	19	20	21	22	23	24
	Red with black ring	Black with black ring	Yellow with black ring	Violet with black ring	Pink with black ring	Aqua with black ring

3.4 Dimensions and Descriptions

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

Item	contents	120M SPAN Value	
		2~12	13-24
Loose tube	Number	1	1
	Diameter (mm)	2.3	2.5
Strength member	Material	FRP	FRP
	Number	2	2
	Diameter (mm)	2.25	2.25
Water Blocking	Material	Water Blocking Yarn	Water Blocking Yarn
Sheath	Material	HDPE	HDPE
	Color	Black	Black
	Thickness (mm)	Minimum: 0.8	Minimum: 0.8
Ripcord	Number	1	1
Cable diameter(mm) Approx.		7.2	7.7
Cable weight(kg/km) Approx.		50	60

3.5 Mail Mechanical and Environmental Performance

Main mechanical performance

Item	Max allowable tension (N)	Crush (N/100mm)	
		Short term	Long term
2~24	1000	1000	300

Environmental and installation condition

Max. wind speed	Max. ice thickness	Initial Installation sag	Temperature
16.7m/s	0	1.0%	4 0 ºC～+7 0 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 60794-1-21-E1** Load: According to 3.5 Sample length: Not less than 50m. Duration time: 1min	Additional attenuation: ≤0.1dB after test. No damage to outer jacket and inner elements.
Crush	**IEC 60794-1-21-E3** Load: According to 3.5 Duration of load: 1min	Additional attenuation: ≤0.1dB after test. No damage to outer jacket and inner elements.
Impact	**IEC 60794-1-21-E4** Radius: 300 mm. Impact energy: 4.5J Impact number: 1. Impact points:3	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements.
Repeated bending	**IEC 60794-1-21-E6** Bending radius: 20*D Cycles: 25. Load: 150N	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements.
Torsion	**IEC 60794-1-21-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 60794-1-22-F5B** Time : 24 hours. Sample length : 3m. Water height : 1m	No water leakage, except the part of stranded wire.
Temperature cycling	**IEC 60794-1-22-F1** Sample length: at least 1000m. Temperature range: -40℃～+70℃ Cycles: 2. Temperature cycling test dwell time: 12 hours.	The change in attenuation coefficient shall be less than 0.05 dB/km.
Other parameters	According to **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.
- Interval: 1±1% m.
- Outer sheath marking legend can be changed according to user's requests.

5.2 Reel Length

Standard reel length: 4Km/reel, other length is also available.

5.3 Cable Drum

The cables are packed in fumigated wooden drums.

5.4 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.