

ANTI RODENT  
DIELECTRIC  
DUCT CABLE

AR-1FGDPE13-RP-xxF-G652D

# OPTICAL FIBRE CABLE TECHNICAL SPECIFICATION

## 1. General

### 1.1 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 products through several programs including ISO 9001, ISO 14001 and ROHS.

Cable type	Application
AR-1FGDPE13-RP-xxF-G652D	Direct burial installation

xx represents the fibre count of the cable.

### 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 60794-3-10	Optical fibre cables-part 3-10: Outdoor cables-Detailed specification for duct and directly buried single-mode optical fibre telecommunication cables.
IEC 60794-3-11	Optical fibre cables-part 3-11: Outdoor cables-Detailed specification for duct and directly buried single-mode optical fibre telecommunication 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 years (25) without detriment to the operation characteristics of the cable.

## 1.4 Application

Item	Value
Operation temperature	-40 °C~+70 °C
Installation temperature	-40 °C~+70 °C
Storage temperature	-40 °C~+70 °C
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.652D.

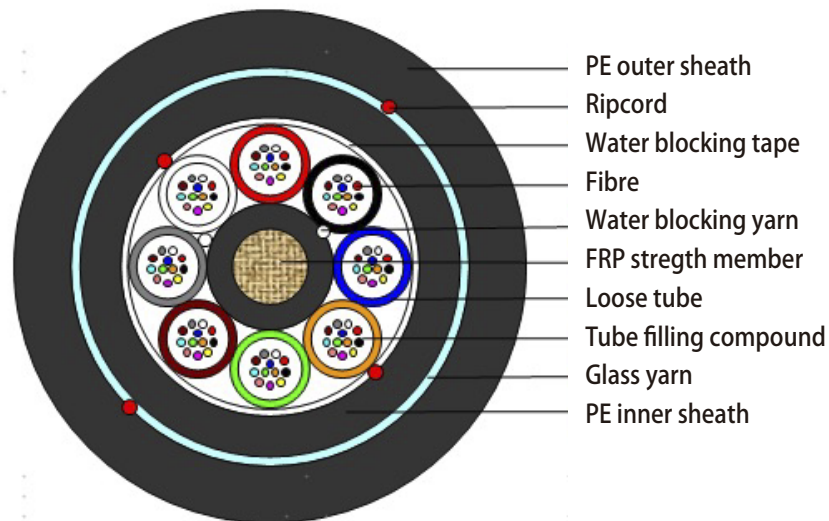
Parameter	Specification
MFD (1310nm)	8.7~9.5 $\mu$ m
Cladding diameter	125 +/- 1.0 $\mu$ m
Fiber diameter	235~255 $\mu$ m with UV coating, and colored to : 250 +/- 15 $\mu$ m
Core/cladding concentricity error	$\leq$ 0.6 $\mu$ m
Coating/cladding concentricity error	$\leq$ 12.0 $\mu$ m
Cladding non circularity	$\leq$ 1.0%
Cable Cut off wavelength	$\lambda_{cc} \leq$ 1260nm
Attenuation coefficient	1310nm: 0.35dB/km 1550nm: 0.21dB/km
Bending-loss performance of optical fiber @1310nm&1550nm	$\leq$ 0.05dB (100 turns around a mandrel of 50mm diameter)
Polarization mode dispersion maximum individual fibre	$\leq$ 0.2ps/ $\sqrt$ km
Polarization mode dispersion link value	$\leq$ 0.1ps/ $\sqrt$ km
Zero-dispersion wavelength	1300~1324nm
Zero-dispersion slope	$\leq$ 0.092ps/nm <sup>2</sup> ·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 fibre and loose tube will be identification in accordance with the following color sequence, other sequence is also available. The color of fillers will be natural.

	1	2	3	4	5	6
Fiber color code	● Blue	● Orange	● Green	● Brown	● Grey	○ White
	7	8	9	10	11	12
	● Red	● Black	● Yellow	● Violet	● Pink	● Aqua

### 3.4 Dimensions and Descriptions

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

Parameter	Contents	Value			
		6/12/24/36	48/72	96	144
Structure	Type	1+6		1+8	1+12
Loose tube	Fiber counts/tube	6	12		
	Outer diameter (mm)	2.1	2.2		
Central strength member	Material	FRP			
	Diameter (mm)	2.25	2.4	2.8	3.5
	PE layer diameter (mm)	/	/	3.7	6.5
Water blocking	Material	Water blocking tape and yarn			
Inner Sheath	Material	MDPE			
	Color	Black			
	Thickness (mm)	Nominal: 0.8			
Peripheral strength member	Material	Glass yarn			
Outer sheat	Material	HDPE			
	Color	Black			
	Thickness (mm)	Nominal: 1.7			
Ripcord	Number / Color	2+2 / Red			
Cable diameter(mm) Approx.		12.3	12.6	13.8	16.6
Cable weight(kg/km) Approx.		125	130	155	225

### 3.5 Main Mechanical and Environmental Performance

#### Main mechanical performance

Item	Tension (N)	Crush(N/100mm)
6/12/24/36/48/72/96/144	2700	1500

## 4. Main 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.

Item	Test Method	Requirements
<b>Tension</b>	<b>IEC 60794-1-2-E1</b> Load: According to 3.5 Sample length: Not less than 50m. Duration time: 1min.	Additional attenuation: $\leq 0.05$ dB after test. No damage to outer jacket and inner elements.
<b>Crush</b>	<b>IEC 60794-1-2-E3A</b> Load: According to 3.5 Duration of load: 1min	Additional attenuation: $\leq 0.05$ dB after test. No damage to outer jacket and inner elements.
<b>Impact</b>	<b>IEC 60794-1-21-E4</b> Radius: 300 mm. Impact energy: 10 J. Impact number: 1. Impact points: 3	Additional attenuation: $\leq 0.1$ dB No damage to outer jacket and inner elements.
<b>Repeated bending</b>	<b>IEC 60794-1-21-E6</b> Bending radius: $20 \cdot D$ . Cycles: 25 Load: 150N	Additional attenuation: $\leq 0.05$ dB No damage to outer jacket and inner elements
<b>Torsion</b>	<b>IEC 60794-1-21-E7</b> Cycles: 10. Length under test: 1m. turns: $\pm 180^\circ$ . Load: 150N	Additional attenuation: $\leq 0.1$ dB No damage to outer jacket and inner elements.
<b>Water Penetration</b>	<b>IEC 60794-1-22-F5B</b> Time : 24 hours. Sample length : 3m. Water height : 1m	No water leakage.
<b>Temperature cycling</b>	<b>IEC 60794-1-22-F1</b> Sample length: at least 1000m. Temperature range: $-40 \sim +70^\circ\text{C}$ . Cycles: 2. Temperature cycling test dwell time: 12 hours.	The change in attenuation coefficient shall be less than 0.05 dB/km.
<b>Other parameters</b>	According to <b>IEC 60794-1</b>	

## 5. Packaging and Drum

### 5.1 Cable Sheath Marking

Unless otherwise specified, the cable sheath marking shall be as follows:  
Color: white. Contents: ARTIC, 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: 4 km/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.