



DUCT CABLE

AR-21FADZPE- xxF-G52D

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

Cable type	Application
AR-21FADZPE-xxF-GG52D	Duct installation

xx represents the fibre counts 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.652	Characteristics of a single-mode optical fibre
IEC 60794-1-1	Optical fibre cables-part 1-1: Generic specification-General
IEC 60794-1-2	Optical fibre cables-part 1-2: Generic specification-Basic optical cable test procedure
IEC 60794-3	Optical fibre cables-part 3: Sectional specification-Outdoor cables
IEC 60794-4-10	Optical fibre cables-part 3-10: Outdoor cables-Family specification for duct and direct buried optical communication cables
IEC 60794-4-11	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 (25) years without detriment to the operation characteristics of the cable.

1.4. APPLICATION

Item	Value
Installation temperature	-40 °C~+70 °C
Operation 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

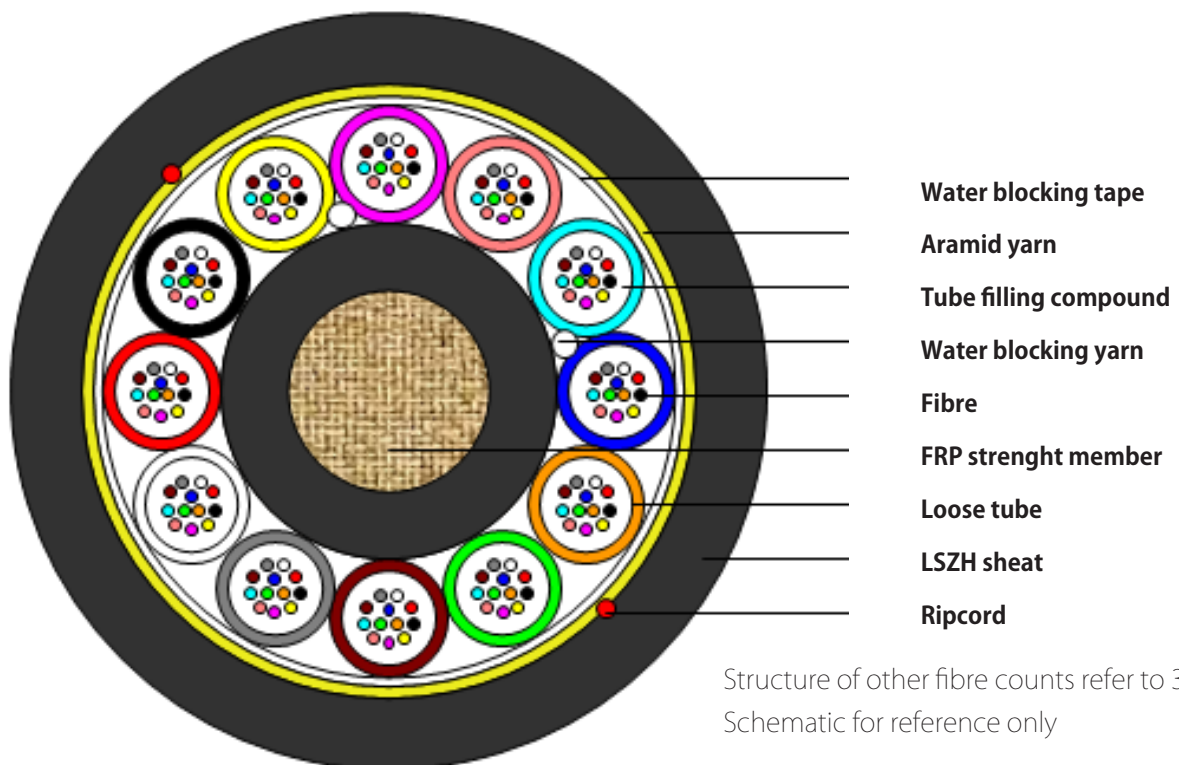
Optical Fibres supplied in this specification meet the requirements of ITU-T G.652.D

Parameter	Specification
MFD (1310nm)	8.7~9.5 μm
Cladding diameter	125 \pm 1.0 μm
Fiber diameter	245 \pm 7 μm , with UV coating, and colored to : 250 \pm 15 μm
Core/cladding concentricity error	\leq 0.6 μm
Coating/cladding concentricity error	\leq 12.0 μm
Cladding non circularity	\leq 1.0%
Cut off wavelength	$\lambda_{cc} \leq 1260\text{nm}$
Attenuation coefficient	1310nm: 0.35dB/km max after cabling 1550nm: 0.21dB/km max after cabling
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/ $\sqrt{\text{km}}$
Polarization mode dispersion link value	\leq 0.1ps/ $\sqrt{\text{km}}$
Zero-dispersion wavelength	1300~1324nm
Zero-dispersion slope	\leq 0.092ps/nm ² ·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



3.3. FIBRE AND LOOSE TUBE IDENTIFICATION

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

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

3.4. DIMENSIONS AND DESCRIPTIONS

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

Parameter	Contents	Value			
		12/24	36/48/72	96	144
Structure	Type	1+6	1+6	1+8	1+12
Loose tube	Fiber counts/tube	6	12	12	12
	Outer diameter (mm)	1.9	2.1	2.1	2.1
Central strength member	Material	FRP			
	Diameter (mm)	2.0	2.25	2.25	2.6
	PE layer diameter (mm)	-	-	3.5	6.1
Water blocking	Material	Water Blocking Tape & Yarn			
Peripheral strength member	Material	Aramid yarn			
Outer sheath	Material	LSZH			
	Color	Black			
	Thickness (mm)	Nominal: 1.5			
Cable diameter(mm) Approx.		9.2	9.8	11.2	13.8
Cable weight(kg/km) Approx.		95	105	130	185

3.5. MAIN MECHANICAL AND ENVIRONMENTAL PERFORMANCE

Item	Tension(N)	Crush(N/100mm)	
		Short term	Long term
12~144	1500	1000	300

5. 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: 1 min.	Additional attenuation: ≤ 0.1 dB after test No damage to outer jacket and inner elements
Crush	IEC 60794-1-2-E3 Load: According to 3.5 Duration of load: 1 min	Additional attenuation: ≤ 0.1 dB 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: ≤ 0.1 dB No damage to outer jacket and inner elements
Repeated Bending	IEC 60794-1-2-E6 Bending radius: $20 \times D$ Cycles: 25 Load: 150 N	Additional attenuation: ≤ 0.1 dB No damage to outer jacket and inner elements
Torsion	IEC 60794-1-2-E7 Cycles: 10 Length under test: 1m Turns: $\pm 180^\circ$ Load: 150 N	Additional attenuation: ≤ 0.1 dB 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: $-40^\circ\text{C} \sim +70^\circ\text{C}$ Cycles: 2 Temperature cycling test dwell time: 12 hours	The change in attenuation coefficient shall be less than 0.05 dB/km.
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
- 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 LENGHT

Standard reel length: 2/3 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.