

# Loose Tube DJ/DA Cable

1 of 7

12F, 24F, 36F, 48F, 72F, 96F, 144F



Rendering is for Schematic Purposes Only

## Part Numbers:

- 10-16001.02A - 12F Loose Tube DJ/DA Cable
- 10-16006.02A - 24F Loose Tube DJ/DA Cable
- 10-16011.02A - 48F Loose Tube DJ/DA Cable
- 10-16016.02A - 72F Loose Tube DJ/DA Cable
- 10-16021.02A - 96F Loose Tube DJ/DA Cable
- 10-16026.01A - 144F Loose Tube DJ/DA Cable

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## General/Scope

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

Cable type	Application
Loose Tube DJ/DA Cable	Duct or Burial installation

## Reference

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

ITU-T G.652	Characteristics of a single-mode optical fiber
ITU-T G.657	Characteristics of a single-mode optical fiber
IEC 60794-1-1	Optical fiber cables-part 1-1: Generic specification-General
IEC 60794-1-21	Optical fiber cables- part1-2-Generic specification-Basic optical cable test procedure-Mechanical test methods
IEC 60794-1-22	Optical fiber cables- part1-2-Generic specification-Basic optical cable test procedure-Environmental test methods
IEC 60794-3	Optical fiber cables-part 3: Sectional specification-Outdoor cables
IEC 60794-3-10	Optical fiber cables-part 3-10: Outdoor cables-Family specification for duct and direct buried optical communication cables
IEC 60794-3-11	Optical fiber cables-Part 3-11: Outdoor cables-Detailed specification for duct and directly buried single-mode optical fiber telecommunication cables

## 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.

## Application

Item	Value
Operation temperature	-40 °C~+70 °C
Storage temperature	-40 °C~+70 °C
Static bending radius	15 times the cable diameter
Dynamic bending radius	30 times the cable diameter

**Optical Fiber**

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

Parameter	Specification
MFD (1310nm)	8.7~9.5 $\mu$ m
Cladding diameter	125 $\pm$ 1.0 $\mu$ m
Fiber diameter	235~255 $\mu$ m, with UV coating, and colored to : 250 $\pm$ 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%
Cut off wavelength	$\lambda_{cc} \leq$ 1260nm
Attenuation coefficient	1310nm: 0.36dB/km max after cabling 1550nm: 0.22 dB/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 fiber	$\leq$ 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

Optical fibers supplied in this specification meet the requirements of ITU-T G.657A1

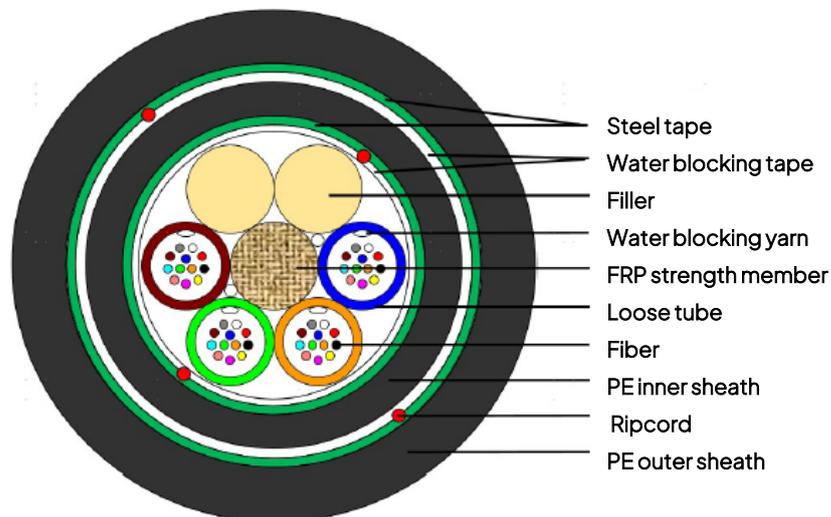
Parameter	Specification
MFD (1310nm)	8.4~9.2 $\mu$ m
Cladding diameter	125 $\pm$ 0.7 $\mu$ m
Fiber diameter	235~255 $\mu$ m, with UV coating, and colored to : 250 $\pm$ 15 $\mu$ m
Core/cladding concentricity error	$\leq$ 0.5 $\mu$ m
Coating/cladding concentricity error	$\leq$ 12.0 $\mu$ m
Cladding non circularity	$\leq$ 0.7%
Cut off wavelength	$\lambda_{cc} \leq$ 1260nm
Attenuation coefficient	1310nm:0.36dB/km max after cabling 1550nm:0.22dB/km max after cabling
Bending-loss performance of optical fibers @1550nm	$\leq$ 0.25dB (10 turns around a mandrel of 30mm diameter)
Polarization mode dispersion maximum individual fiber	$\leq$ 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

### Optical Cable 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

### Cross Section of Cable

10-16011.02A



Schematic for reference only

### 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.

	1	2	3	4	5	6
Color code	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.

## 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.

Item	Contents	Value							
		12	24	36	48	72	96	144	
Loose tube	Number	1	2	3	4	6	8	12	
	Outer diameter (mm)	2.4							
Filler	Number	5	4	3	2	0	0	0	
Max. fiber counts per tube		12							
Central strength member	Material	FRP							
	Diameter (mm)	2.6					3.5		
	PE layer diameter (mm)	-					4.2	7.2	
Water blocking	Material	Water blocking tape & yarn							
Ripcord	Number	2							
Armor	Material	Two side (Special) coated steel tape							
Inner sheath	Material	MDPE							
	Color	Black							
	Thickness (mm)	Nominal: 1.0							
Water blocking	Material	Water blocking tape & yarn							
Ripcord	Number	2							
Armor	Material	Two side (Special) coated steel tape							
Outer sheath	Material	MDPE							
	Color	Black							
	Thickness (mm)	Nominal: 1.8							
Cable diameter (mm) Approx.		16.9					18.7	21.6	
Cable weight (kg/km) Approx.		225					270	350	

## Main Mechanical Performance

Tension (N)		Crush (N/100mm)	
Short term	Long term	Short term	Long term
2700	900	2200	1100

**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
Tension	<u>IEC 60794-1-21-E1</u> 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	<u>IEC 60794-1-21-E3</u> Load: According to 3.5  Duration of load: 1min	Additional attenuation: ≤0.1dB after test No damage to outer jacket and inner elements
Impact	<u>IEC 60794-1-21-E4</u> Radius: 300mm Impact energy: 4.5J Impact number: 3 Impact points: 3	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Bend	<u>IEC 60794-1-21-E11A</u> Mandrel radius: 15*D Turns:10 Cycles:5	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Repeated bending	<u>IEC 60794-1-21-E6</u> Bending radius: 30*D Cycles: 30  Load: 150N	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Torsion	<u>IEC 60794-1-21-E7</u> Cycles:10 Length under test: 1m Turns: ± 90° Load: 150N	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Temperature cycling	<u>IEC 60794-1-22-F1</u> Sample length: at least 1000m Temperature range: -40°C ~+70°C Cycles: 2  Temperature cycling test dwell time: 8 hours	The change in attenuation coefficient shall be less than 0.1 dB/km at 1550nm.
Water Penetration	<u>IEC 60794-1-22-F5B</u> Time : 24 hours Sample length : 3m Water height : 1m	No water leakage.
Other parameters	According to <u>IEC 60794-1</u>	

## Packaging and Drum

### Cable Sheath Marking

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

- Color: white
- Contents: RaDD, 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.

### Reel Length

Standard reel length: 10,000 & 20,000 ft/reel, other length is also available.

### Cable Drum

The cables are packed in fumigated wooden drums.

### 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.