Loose Tube Single Jacket/Dielectric Cable

12F, 24F, 48F, 72F, 96F, 144F, 288F, 432F

Rendering is for Schematic Purposes Only

Part Number :

10-18001.02A - 12F Loose Tube SJ/Dielectric Cable

10-18006.02A - 24F Loose Tube SJ/Dielectric Cable

10-18011.02A - 48F Loose Tube SJ/Dielectric Cable

10-18016.02A - 72F Loose Tube SJ/Dielectric Cable

10-18021.02A - 96F Loose Tube SJ/Dielectric Cable

10-18026.01A - 144F Loose Tube SJ/Dielectric Cable

10-18031.01A - 288F Loose Tube SJ/Dielectric Cable

10-18036.01A - 432F Loose Tube SJ/Dielectric Cable

General

This specification covers the design requirements and performance standard for the supply of optical fiber cable in the industry. It also includes RaDD premium designed cable with optical, mechanical and geometrical characteristics.

Cable type	Application
Loose Tube SJ/Dielectric Cable n represent the number of fibers in the cable.	Duct installation

Cable Description

RaDD cable has excellent optical transmission and physical performance, to meet customer requirements.

Quality

RaDD ensures a stable quality control system for our cable products through several programs including ISO 9001, ISO 14001 and OHS.

Reliability

Initial and periodic qualification tests for raw material and cable product are performed to assure the cable's performance and durability in the field environment.

Reference

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 60794-3-10	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.

2. Optical Fibre In Cable

Optical Fiber in Cable

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

Parameters	Specification
MFD (1310nm)	9.2+/-0.4um
MFD (1550nm)	10.4+/-0.5um
Cladding diameter	mμ1.0±mμ125
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: 0.36dB/km max after cabling
	1550nm: 0.22dB/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 link value	≤0.1ps/√km
Zero-dispersion wavelength	1312+/-12nm
Zero-dispersion slope	≤0.091ps/nm^2.km

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

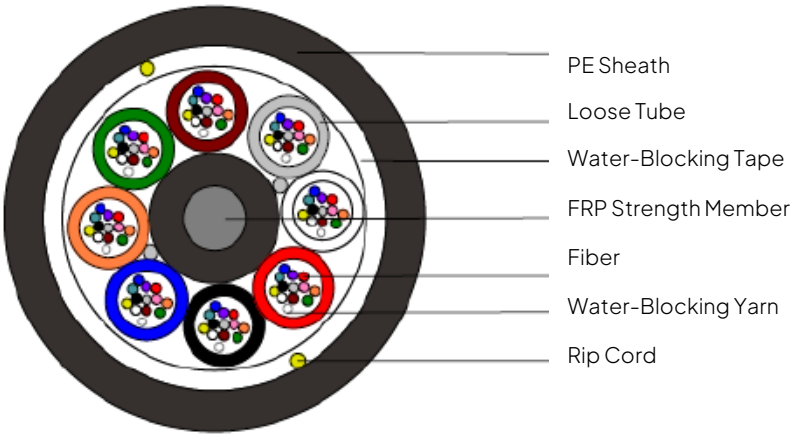
Parameters	Specification
MFD (1310nm)	8.8+/-0.4um
MFD (1550nm)	9.8+/-0.5um
Cladding diameter	125+/-0.7um
Fiber diameter	245+/-5um, with UV coating, and colored to : 250+/-15um
Core/cladding concentricity error	≤ 0.5um
Coating/cladding concentricity error	≤ 12.0um
Cladding non-circularity	≤ 0.7%
Cut-off wavelength	λcc ≤1260nm
Attenuation coefficient	1310nm: 0.36dB/km max after cabling 1550nm: 0.22dB/km max after cabling
Bending-loss performance of optical fibers @1550nm	≤0.03dB (10 turns around a mandrel of 30mm diameter)
Polarization mode dispersion link value	≤0.1ps/√km
Zero-dispersion wavelength	1312+/-12nm
Zero-dispersion slope	≤0.092ps/nm^2.km

Optical Cable General Design

Optical fibers are housed in loose tubes that are made of high-modulus plastic and filled without any waterproof compounds except water block yarns, and there is no any jelly in the cable core, so the cable is totally dry type and different from those semi-dry cables.
FRP is applied as central strength member.
PP loose tubes are SZ stranded around the central strength member.
Dry water blocking material is used in and over the cable core to prevent it from water ingress. Polyethylene sheath are applied as outer sheath.
Two ripcords for easy removal of jacket.

Cross Section of Cable

10-18021.02A



Schematic Purposes Only

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
- Gel-Free water blocking design simplifies access, saves time and avoids environmental pollution, small diameter and light weight extend installation length
- High quality raw material guarantee the long service life of cable

Dimensions and Descriptions of Cable Constructions

The standard structure Loose Tube SJ/Dielectric cable is shown in the following table, other structure and fiber count are also available according to customer requirements.

Item	Contents	Value								
		24	36	48	72	96	144	216	288	432

Loose tube	Number	2	3	4	6	8	12	18	24	36
	Outer diameter (mm)	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Filler	Number	4	3	2	0	0	0	0	0	0
Max. fiber counts per tube	B1.3/B6A1	12								
Central strength member	Material	FRP								
	Diameter (mm)	2.6				3.5	3.5	2.6	3.5	2.8
	PE layer diameter (mm)	-				4.2	7.2	-	4.8	-
Water Blocking Material	Material	Water Blocking Tape& Yarn								
sheath	Material	PE								
	Color	Black								
	Thickness (mm)	Nominal: 1.6								
Ripcord	Number	2								
Cable diameter(mm) Approx.		11.1				12.7	15.7	15.9	18.1	20.9
Cable weight(kg/km) Approx.		90				103	162	158	200	270

Main Mechanical and Environmental Performance of Cable

Fiber counts	Tensile performance(N)		Crush(N/100mm)	
	Short term	Long term	Short term	Long term
24~72	1500	500	2200	1100
96~432	2700	900	2200	1100

Operation temperature: -40℃～+70℃

Color Code of the Fiber

Each fiber can be identifiable throughout the length of the cable in accordance with the following color sequence.

Fibres tube color code	1	2	3	4	5	6
	Blue	Orange	Green	Brown	Slate	White
	7	8	9	10	11	12
	Red	Black	Yellow	Purple	Pink	Aqua

Color Code of the Loose Tube and Filler

The loose tubes will be identifiable in accordance with the following color sequence, other sequence also is available. The color of the fillers will be natural.

Tube color	1	2	3	4	5	6

code						
	Blue	Orange	Green	Brown	Slate	White
	7	8	9	10	11	12
	Red	Black	Yellow	Purple	Pink	Aqua
	13	14	15	16	17	18
	Blue with black Stripe	Orange with black Stripe	Green with black Stripe	Brown with black Stripe	Slate with black Stripe	White with black Stripe
	19	20	21	22	23	24
	Red with black Stripe	Black with Yellow Stripe	Yellow with black Stripe	Purple with black Stripe	Pink with black Stripe	Aqua with black Stripe
	25	26	27	28	29	30
	Blue with yellow Stripe	Orange with yellow Stripe	Green with yellow Stripe	Brown with yellow Stripe	Slate with yellow Stripe	White with yellow Stripe
	31	32	33	34	35	36
	Red with yellow Stripe	Black with white Stripe	Yellow with white Stripe	Purple with yellow Stripe	Pink with yellow Stripe	Aqua with yellow Stripe

Mechanical, Electrical 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	IEC 60794-1-2-E1 Load: According to 3.2.3 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 60794-1-2-E3 Load: According to 3.2.3 Duration of load: 1min	Additional attenuation: ≤0.1dB after test No damage to outer jacket and inner elements
Impact	IEC 60794-1-2-E4 Radius: 300mm Impact energy: 4.5J Impact number: 1 Impact points: 3	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Bend	IEC 60794-1-2-E11A Mandrel radius: 12.5*D Turns:10 Cycles:5	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Repeated bending	IEC 60794-1-2-E6 Bending radius: 20*D Cycles: 30 Load: 150N	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements

Torsion	IEC 60794-1-2-E7 Cycles:10 Length under test: 1m Turns: ± 90° Load: 150N	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Temperature cycling	IEC 60794-1-2-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 0.1 dB/km
Water Penetration	IEC 60794-1-2-F5B Time : 24 hours Sample length : 3m Water height : 1m	No water leakage.
Other parameters	According to IEC 60794 -1	

Packaging and Drum

Cable Sheath Marking

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

- Method: hot foil
- Color: white
- Contents: RaDD, the year of manufacture, the type of cable, cable number, length
- marking Interval: 1±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 cable ends are protected against water penetration and firmly secured to the drum, so the cable cannot move and the turns cannot slide when it is moved, handled or laid. The inner end has around 2 meters of accessible length to perform reception tests.