

# Flat Drop Toneable Cable

1F - 24F G.657A1+24AWG



Rendering for Schematic Purposes Only

## Part Numbers:

- 10-11002.01A - 1F Flat Drop Toneable Cable
- 10-11007.01A - 2F Flat Drop Toneable Cable
- 10-11011.01A - 4F Flat Drop Toneable Cable
- 10-11016.01A - 6F Flat Drop Toneable Cable
- 10-11021.01A - 12F Flat Drop Toneable Cable
- 10-11026.01A - 24F Flat Drop Toneable Cable

## CONTACT & INFORMATION:

Tel: (920) 328-1020 Email: [sales@raddnetwork.com](mailto:sales@raddnetwork.com) Website: [RaDDNetwork.com](http://RaDDNetwork.com)



## 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
Flat Drop Toneable Cable	Self-supporting aerial installation

## Cable Description

Optical fibers are housed in loose tubes that are made of high-modulus plastic and filled with waterproof compounds.

FRP is applied as strength member.

Water blocking yarns are used in and over the cable core to prevent it from water ingress. polyethylene sheath are applied as outer sheath.

Copper Wire are used as conduction current.

## 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 60794-1-2	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 60794-3-20	Optical fiber cables-part 3-20: Outdoor cables-Family specification for optical self-supporting aerial communication 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.

## Optical Fiber

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

Parameters	Specification
MFD (1310nm)	9.1+/-0.4um
MFD (1550nm)	10.4+/-0.5um
Cladding diameter	125+/-1.0um
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%
Cable Cut off wavelength	$\lambda_{cc} \leq 1260\text{nm}$
Attenuation coefficient	1310nm: 0.36dB/km max after cabling
	1550nm: 0.22dB/km max after cabling
Bending-loss performance of optical fiber @1550nm&1625nm	≤ 0.05dB (100 turns around a mandrel of 60mm diameter)
Polarization mode dispersion link value	≤ 0.1ps/km-1/2
Zero-dispersion wavelength	1300~1324nm
Zero-dispersion slope	≤ 0.092ps/nm <sup>2</sup> *km

Optical Fibers supplied in this specification meet the requirements of ITU-T G.657a1

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	$\lambda_{cc} \leq 1260\text{nm}$

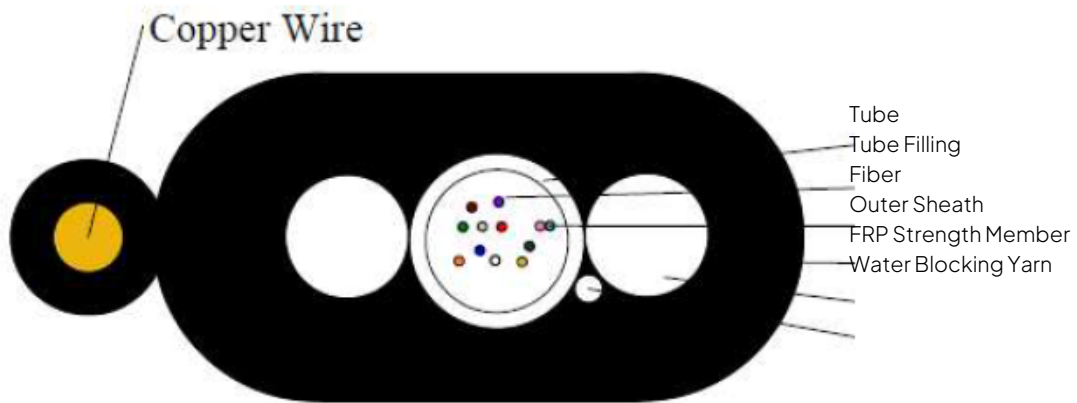
Attenuation coefficient	1310nm: 0.36dB/km max after cabling
	1550nm: 0.22dB/km max after cabling
Bending-loss performance of optical fibers @1550nm	≤0.25dB (10 turns around a mandrel of 30mm diameter)
Polarization mode dispersion link value	≤0.06ps/km-1/2
Zero-dispersion wavelength	1300~1324nm
Zero-dispersion slope	≤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

10-11021.01A - 12F Flat Drop Toneable Cable



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### 3.3 Fiber and Loose Tube Identification

The color code of fibers will be identification in accordance with the following color sequence, other sequence also is available

Fiber color code	24 fibers per tube	1	2	3	4	5	6
		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 ring	Orange with black ring	Green with black ring	Brown with black ring	Slate with black ring	White with black ring
		19	20	21	22	23	24
		Red with black ring	Nature	Yellow with black ring	Purple with black ring	Pink with black ring	Aqua with black ring

The color of the tube will be natural.

### Dimensions and Descriptions

The standard structure of Flat Drop Toneable Cable is shown in the following table.

Item	contents	Value
Loose tube	number	1
	Outer diameter (mm)	3.0
Copper Wire diameter (mm)		0.58
Max. fiber counts per tube		1~24
strength member	material	FRP
	number	2
	diameter (mm)	1.8
Water Blocking Material	Material	Water Blocking Yarn
	number	1
sheath	Material	PE
	Color	Black
	Thickness (mm)	Nominal: 0.8
Cable diameter(mm) Approx.		9.8 (±0.4) ×4.7 (±0.3)
Cable weight(kg/km) Approx.		42

### Main Mechanical and Environmental Performance

Item	Value
	2~24
Tensile performance(N)	1400
Crush (N/100mm)	2000
Operation temperature:	-40°C~+70°C
Installation temperature	-30°C~+70°C
Storage temperature	-40°C~+70°C

### 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	<u>IEC 60794-1-2-E1</u> Load: According to 3.5 Sample length: Not less than 50m. Duration time: 1min.	Additional attenuation: $\leq 0.1$ dB after test No damage to outer jacket and inner elements
Crush	<u>IEC 60794-1-2-E3</u> Load: According to 3.5 Duration of load: 1min	Additional attenuation: $\leq 0.1$ dB after test No damage to outer jacket and inner elements
Impact	<u>IEC 60794-1-2-E4</u> Radius: 300 mm Impact energy: 4.5 J Impact number: 1 Impact points: 3	Additional attenuation: $\leq 0.1$ dB No damage to outer jacket and inner elements
Bend	<u>IEC 60794-1-2-E11A</u> Mandrel radius: $10 \times D$ Turns: 4 Cycles: 3	Additional attenuation: $\leq 0.1$ dB No damage to outer jacket and inner elements
Repeated bending	<u>IEC 60794-1-2-E6</u> Bending radius: $20 \times D$ Cycles: 25 Load: 150N	Additional attenuation: $\leq 0.1$ dB No damage to outer jacket and inner elements
Torsion	<u>IEC 60794-1-2-E7</u> 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
Water Penetration	<u>IEC 60794-1-2-F5B</u> Time: 24 hours Sample length: 3m Water height: 1m	No water leakage.
Temperature cycling	<u>IEC 60794-1-2-F1</u> 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 0.1 dB/km.
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:

- Method: inkjet
- Color: white
- Contents: RaDD, the year of manufacture, the type of cable, cable number, length marking
- Interval:  $1\pm 1\%$  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.