

 <b>TAIHAN</b> FIBEROPTICS	<b>TAIHAN FIBEROPTICS</b> TECHNICAL PROPOSAL FOR DROP CABLE	01-Feb-2018
-		TFO-OPTIC-DR-CT-C- 16007E-DFNHYHYB-R5- 02.2018

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# *Specification*

**FOR**  
**Indoor Low Friction Drop Cable**  
**Optical Fiber Cable Specification**  
**for Steel Flat Drop**

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## 1. GENERAL

This specification covers the general requirements and characteristics of drop cable used for indoor and outdoor applications.

## 2. APPLICABLE STANDARDS

ITU-T G.650	Definition and test methods for the relevant parameters of single-mode fibers
ITU-T G.657	Characteristics of a single-mode optical fiber and cable
IEC 60793-1	Optical fiber Part 1 : Generic specification
IEC 60793-1	Optical fiber Part 2 : Product specifications
IEC 60794-1	Standard for optical fiber outside plant communications cable

## 3. OPTICAL FIBERS

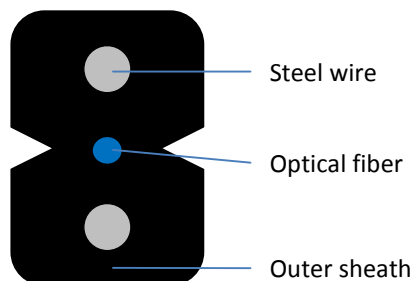
The optical and geometrical performance of the optical fibers shall be in accordance with below table 1.

[ Table 1. ] The Characteristics of Single Mode Fibers

Parameter	Specification G.657 A2
Attenuation coefficient of cabled @ 1310nm @ 1550nm	≤ 0.40 dB/km ≤ 0.30 dB/km
Cable cut-off wavelength	≤ 1260nm
Zero-dispersion wavelength	1300 ~ 1324nm
Zero-dispersion slope	≤ 0.092 ps/nm <sup>2</sup> .km
Chromatic dispersion @ 1285 ~ 1330nm @ 1550nm	≤ 3.5 ps/nm <sup>2</sup> .km ≤ 18.0 ps/nm <sup>2</sup> .km
Mode field diameter @ 1310nm	8.6 ± 0.4μm
Core concentricity error	≤ 0.5μm
Cladding diameter	125.0 ± 0.7μm
Cladding non-circularity	≤ 0.7 %
Primary Coating diameter	245 ± 10μm
Proof test level	100 kpsi, 1%
Macro-bending loss 15mm radius, 10 turns @ 1550nm 10mm radius, 1 turns @ 1550nm 7.5mm radius, 1 turns @ 1550nm	≤ 0.03 dB ≤ 0.1 dB ≤ 0.5 dB

#### 4. CABLE STRUCTURE

##### 4.1 Cross-sectional drawing



[ Not to Scale ]

##### 4.2 Construction

[ Table 2. ] The Cable construction of drop cable

Structure	Material		Specification
			1C
Optical fiber	Fiber		G.657 A2
	Fiber Color		Blue
Strength member	Material		Steel
	No. /Diameter(Nom. mm)		2EA / 0.5±0.05
Outer sheath	Material		LSZH UV Resistance
	Color		Black
Cable	Diameter (mm)	Width	2.0±0.2
		Height	3.0±0.3
	Weight (Nom. kg/km)		11

##### 4.3 Sheath Marking

###### 4.3.1 Sheath Marking

The cable shall have the following information clearly marked on the cable outer sheath at regular interval of one meter by Ink Jet printer with black color.

**0000M TAIHANFIBEROPTICS "DESCRIPTION" 1F G657A2 "DATE" "CUSTOMER" "CONTRACT" "CODE" 0001M**

- Sequential Length : **0001 M ~ 000X M**
- Manufacturer : **TAIHANFIBEROPTICS**
- Cable Description : **CFO DROP PLANO BAJA FRICCION**
- Number / Type of Fibers : **1F G657A2**
- Manufacturing Date : **"DATE" XX.YYYY (Month.Year)**
- Customers Name : **"CUSTOMER"**
- Contract Number : **"CONTRACT"**
- Manufacturing Code : **"CODE"**

## 5. CABLE PROPERTIES

### 5.1 Mechanical & Environmental properties

#### 5.1.1 Cable bending radius

Installation	:	20 x cable diameter (during installation)
Operating	:	10 x cable diameter (during operation)


#### 5.1.2 Temperature range

Installation	:	-20°C to +60°C
Operating	:	-20°C to +60°C

### 5.2 Mechanical & Environmental requirements

[ Table 3. ] Test method and criteria of cable

No	Item	Test Method	Test Criteria
1	Tensile strength IEC-60794-1-2-E1	- Load : 250N - Length: ≥ 90m - Maintained time: 10 mins.	- Attenuation change : ≤ 0.1 dB @1550 nm
2	Compressing strength IEC-60794-1-2-E3	- Load : 48N/cm - Maintained time : 15 mins.	- Attenuation change : ≤ 0.1 dB @1550 nm
3	Impact IEC-60794-1-2-E4	- Hammer dia. : 25mm - Load : 0.74N•m - No. impact : 3	- Attenuation change : ≤ 0.1 dB @1550 nm
4	Torsional strength IEC-60794-1-2-E7	- Length : 2m - Twist angle : ±180° - No. of cycle : 10	- Attenuation change : ≤ 0.1 dB @1550 nm
5	Repeat bending IEC-60794-1-2-E6	- Mandrel dia. : up to 20 X cable diameter - Load : 2 kgf - No. of cycle : 25	- Attenuation change : ≤ 0.1 dB @1550 nm
6	Bending Test	- Mandrel diameter : 20XD - No. of turns : 10 turns (wrapping and unwrapping)	- Attenuation change : ≤ 0.1 dB @1550 nm
7	Frame Retardant IEC-60332-1	- Test procedure : IEC-60332-1	The charred or affected portion shall not have reached within 50mm of the lower edge of the top clamp.
8	Temperature Cycling FOTP-3	- Length : 1,000m: - Temperature cycle: 20°C→-10°C→+40°C→-10°C→+40°C→20°C - Number of cycle: 1 - Time per step: 24 hours	- Attenuation change : ≤ 0.2 dB/km @1550 nm

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## 6. QUALITY CONTROL

### 6.1 Incoming Inspection

All the raw materials that are used for optical fiber cable shall be inspected by the raw material testing methods that are specified by the manufacturer and that are based on 'Korea Standard' or 'ASTM'.

In some cases, suppliers' test report shall substitute for the raw material manufacturer's test.

Any materials that do not meet the manufacturer's raw material specification shall be rejected or scrapped, and the passed materials only shall be used in the process. Some raw material specifications and subsequent raw material test method may be changed without notice, if and only if the new specification and the new test method do not affect the quality of optical fiber cable.

### 6.2 In-Process Inspection

Semi-final goods shall be inspected in accordance with specified manufacturer's testing method. The testing method may be changed without notice, if it does not affect quality of optical fiber cable.

### 6.3 Final Cable Inspection

Following quality properties of finished cable shall be tested to assure the field performances.

- √ Construction / Material
- √ Mechanical characteristics
- √ Optical characteristics

### 6.4 Quality System

TAIHAN FIBER OPTICS applied ISO 9001 and ISO 14001 to assure the conformance to specified requirements during our production.

## 7. PACKING

### 7.1 Cable Packing

7.1.1 Standard length of cable shall be 1,000m. Other cable length is also available if requested by customer.

7.1.2 Each length of the cable shall be wound on a separate plastic reels.

7.1.3 Both ends of the cable shall be sealed with suitable plastic caps to prevent the entry of moisture during shipping, handling and storage.

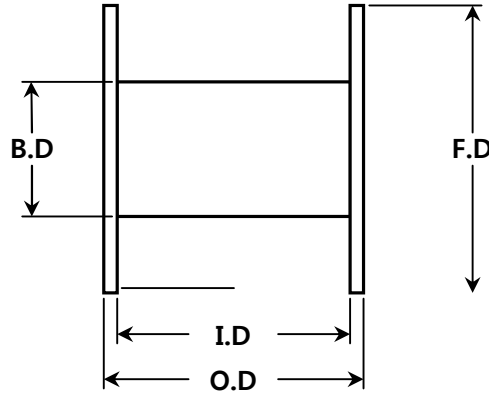
7.1.4 The cable ends shall be securely fastened to the reel to prevent the cable from becoming loose in transit or during placing operations.

7.1.5 Each reel shall be well packed in individual pull-out box.

**7.2 Packing dimension**

[ Table 4. ] Reel dimension

Cable type	Dimension				Standard length
	F.D	B.D	O.W	I.W	
Drop	300	150	290	260	1,000m



[ Table 5. ] Carton box dimension by reels

F.D. of Reel	Box dimension (mm)			Note
	Height	Width	Depth	
300	385	350	335	Pull-out box

[ Table 6. ] Pallet dimension

Pallet dimension (mm)			Note
Height	Width	Depth	
150	1100	1100	

[ Table 7. ] Capacity and dimension of one pallet by reel

F.D. of Reel	Packing dimension/pallet (mm)			Capacity/pallet
	Height	Width	Depth	
300	1700	1100	1100	36 EA

**7.3 Picture of reel and box**



[ Plastic reel ]



[ Pull-out Box ]

- End of Specification -