

# GENERAL

# 1.1 SCOPE

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

Cable Type	Application
ADSS	Self supporting aerial installation

## 1.2 Cable Description

cable possesses high tensile strength and flexibility in compact cable sizes. At the same time, it provides excellent optical transmission and physical performance.

## 1.3 Quality

GL ensures a continuing level of quality in our cable products through several quality control programs including ISO 9001.

# 1.4 Reliability

Both initial and periodic qualification testing are performed to assure the cable's performance and durability in the field environments.

1.5 The cable are designed, manufactured and tested according to international standards as follow

ITU-TG.652	Characteristics of a single mode optical fiber
ITU-TG.655	Characteristics of a non-zero dispersion -shiffed single mode fibers optical
IEC 60793-1	Optical fiber Part 1: Generic specifications
IEC 60793-2	Optical fiber Part 2: Product specifications
IEC 60794-4	Optical fiber cables-Part 4: Sectional specification-Aerial optical cables along electrical power lines



# B1.3(G652D) single mode fiber

Optics Specifications			
Attenuation(dB/km) @1310nm ≤0.		≤0.34db	o/km
@1383nm (after hydrogen aging) ≤0.32db/km		o/km	
@1550nm		≤0.20db/km	
	@1625nm	≤0.24db	o/km
Dispersion	@1285nm~1340nm	-3.0~3.0	0ps/(nm*km)
	@1550nm	≤18ps/(	nm*km)
	@1625nm	≤22ps/(	nm*km)
Zero-Dispersion waveleng	th	1300~1	324nm
Zero-Dispersion slope		≤0.092p	os/(nm²*km)
Mode field diameter @ 13	10nm	9.2±0.4	μm
Mode field diameter @ 15	50nm	10.4±0.	8µm
PMD	Max. value for fiber on the reel	0.2ps/k	m 1/2
	Max. Designed value for link	0.08ps/	km 1/2
Cable cutoff wavelength, $\lambda$	сс	≤1260n	m
Effective group index(Neff)	@1310nm	1.4675	
Effective group index(Neff)	@1550nm	1.4680	
Macro-bend loss(Φ60mm,100 turns)@1550nm ≤0.05db			)
Back scatter characteristic(@1310nm&1550nm)			
Point discontinuity			≤0.05db
Attenuation uniformity		≤0.05db/km	
Attenuation coefficient difference for bi-directional measurement		≤0.05db/km	
Geometrical characteristics			
Cladding diameter			125±1µm
Cladding non-circularity		≤1%	
Core/cladding concentricity error		≤0.4µm	
Fiber diameter with coating(uncolored)			245±5µm
Cladding/coating concentricity error		≤12.0µm	
Curl		≥4m	
Mechanical characteristic			
Proof test			0.69GPa
Coating strip force(typical value)		1.4N	
Dynamic stress corrosion susceptibility parameter(typical value)		≥20	
Environmental characteristics(@1310nm&1550nm)			
Temperature induced attenuation(-60~+85°C)			≤0.5dB/km
Dry heat induced attenuation(85±2°C,30days)			≤0.5dB/km
Water immersion induced attenuation(23±2°C,30days)			≤0.5dB/km
Damp heat induced attenuation(85±2°C,RH85%,30days)			≤0.5dB/km



3 Cable structure 3.1 Cable Type:-ADSS



## **Technical Characteristics**

1)The unique extruding technology provides the fibers in the tube with good flexibility and bending endurance

2)The unique fiber excess length control method provides the cable with excellent mechanical and environmental properties Multiple water blocking material filling provides dual water blocking function

3)Max length up to 120m for this type cable



Fiber Number	6	12	24	48
Max. No of loose tube / filler No.	1/5	2/4	4/2	6/0
Fiber No. per tube	6	6	6	8
Loose tube diameter		1.8-	2.0mm	
Loose tube material	P	BT polybutyle	ece terephthal	ate
Gel filled in loose tube		•	Yes	
Central strength member diameter		2.0mn	n±0.2mm	
Central strength material	F	RP (Fiber Re	einforced Plast	tic)
Outer sheath thickness		1.8±	0.2mm	
Cable OD		10	.7mm	
Cable weight		Approx	.85 kg/km	
Operation temperature range		-40 deg C	to + 70 deg C	
Installation temperature range		<b>-20</b> ℃	to + 60 ℃	
Transport and storage temperature range		<b>-40</b> ℃	<b>to + 70</b> ℃	
Span		120	meter	
MAT		2.	1KN	
Suitable lines		$\leq$	35kv	
Max. Wind speed		30	)m/s	
Tensile resistance		30	000N	
Crush resistance		2200	N /10cm	
Minimal installation bending radius		20	x OD	
Minimal operation bending radius		10	x OD	



The fibres shall be marked by a coloured coating with 12 different colours according to EIA/TIA 598:

Fibre #1: Blue	Fibre #7: Red
Fibre #2: Orange	Fibre #8: Black (natural with being marked
Fibre #3: Green	Fibre #9: Yellow
Fibre #4: Brown	Fibre #10: Violet
Fibre #5: Slate (Grey)	Fibre #11: Rose (Pink)
Fibre #6: White	Fibre #12: Aqua (Light Blue)



# COLOR IDENTIFICATION OF FIBER

6Fiber	1#	2#	3#	4#	5#	6#
	6Fibers	fillers	fillers	fillers	fillers	fillers
12Fiber	1#	2# 6fiber	3#	4#	5#	6#
	6fiber		filler	filler	filler	filler
24Fiber	1#	2# 6fiber	3# 6fiber	4# 6fiber	5#	6#
	6fiber				filler	filler
36Fiber	1#	2# 6fiber	3# 6fiber	4# 6fiber	5# 6fiber	6#
	6fiber					6fiber
48Fiber	1#	2# 8fiber	3# 8fiber	4# 8fiber	5# 8fiber	6#
	8fiber					8fiber
72Fiber	1#	2#	3#	4#	5#	6#
	6fiber	12fiber	12fiber	12fiber	12fiber	12fiber



# 4.TEST REQUIREMENTS

Approved by various professional optical and communication product institution, GL also conduct various in-house testing in its own Laboratory and Test Center. She also conduct test with special arrangement with the Chinese Government Ministry of Quality Supervision & Inspection Center of Optical Communication Products (QSICO). GL possess the technology to keep its fiber attenuation loss within Industry Standards.

The cable is in accordance with applicable standard of cable and requirement of customer. The following test items are carried out according to corresponding reference. Routine tests of optical fiber

Mode field diameter	IEC 60793-1-45
Mode field Core/clad concentricity	IEC 60793-1-20
Cladding diameter	IEC 60793-1-20
Cladding non-circularity	IEC 60793-1-20
Attenuation coefficient	IEC 60793-1-40
Chromatic dispersion	IEC 60793-1-42
Cable cut-off wavelength	IEC 60793-1-44

#### Test for outdoor cable

4.1 Tension Loading Test

Test Standard	IEC 60794-1-2 E1
Sample length	No less than 50 meters
Load	Max. installation load
Duration time	1 hour
Test results	Additional attenuation:≤0.05dB No
	damage to outer jacket and inner elements

#### 4.2 Crush/Compression Test

Test Standard	IEC 60794-1-2 E3
Load	Crush load
Plate size	100mm length
Duration time	1 minute
Test number	1
Test results	Additional attenuation:≤0.05dB No
	damage to outer jacket and inner elements

#### 4.3 Impact Resistance Test

Test Standard	IEC 60794-1-2 E4
Impact energy	6.5J
Radius	12.5mm
Impact points	3



Impact number	2
Test result	Additional attenuation:≤0.05dB

#### 4.4 Repeated Bending Test

Test Standard	IEC 60794-1-2 E6
Bending radius	20 X diameter of cable
Cycles	25 cycles
Test result	Additional attenuation: ≤ 0.05dB No
	damage to outer jacket and inner elements

## 4.5 Torsion/Twist Test

Test Standard	IEC 60794-1-2 E7
Sample length	2m
Angles	±180 degree
cycles	10
Test result	Additional attenuation:≤0.05dB No damage
	to outer jacket and inner elements

#### 4.6 Bend Test

Test Standard	IEC 60794-1-2 E11B
Mandrel diameter	20 X diameter of cable
Turn number	4
Number of cycles	3
Temperature	20°C
Test result	No damage to outer jacket and inner elements

# Test StandardIEC 60794-1-2 F1Temperature step $+20^{\circ}C \rightarrow -40^{\circ}C \rightarrow +85^{\circ}C \rightarrow +20^{\circ}C$ Time per each stepTransition from 0°C to -40°C:2hours;<br/>duration at -40°C:8 hours; Transition from<br/> $-40^{\circ}C$ to +85 °C:4hours; duration at +85°C:8<br/>hours; Transition from +85°C to 0°C:2hoursCycles5Test resultAttenuation variation for reference value<br/>(the attenuation to be measured before test<br/>at +20±3°C) ≤ 0.05 dB/km

# 4.7 Temperature cycling Test

4.8 Water penetration Test



Test Standard	IEC 60794-1-2 F5
Height of water column	1m
Sample length	1m
Test time	1 hour
Test resul	No water leakage from the opposite of the
	sample

#### 4.9 Drip Test

Test Standard	IEC 60794-1-2 E14
Sample length	0.3m
Temperature	70 °C
Duration	24 hrs
Test result	No filling compound shall drip from tubes

# 5.PACKING AND DRUM

The cables are packed in carton, coiled on Bakelite & wooden drum. During transportation, right tools should be used to avoid damaging the package and to handle with ease. Cables should be protected from moisture; kept away from high temperature and fire sparks; protected from over bending and crushing; protected from mechanical stress and damage.

