GENERAL

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-50m	Self supporting aerial installation or underground

1.1 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.

1.2 Quality

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

1.3 Reliability

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

1.4 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

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B1.3(G652D) single mode fiber

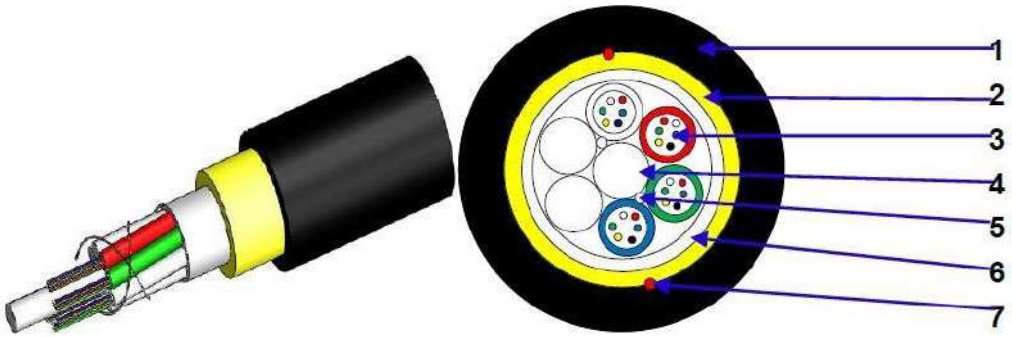
Optics Specifications		
Attenuation(dB/km)	@1310nm	≤0.36db/km
	@1383nm (after hydrogen aging)	≤0.32db/km
	@1550nm	≤0.22db/km
	@1625nm	≤0.24db/km
Dispersion	@1285nm~1340nm	-3.0~3.0ps/(nm*km)
	@1550nm	≤18ps/(nm*km)
	@1625nm	≤22ps/(nm*km)
Zero-Dispersion wavelength		1300~1324nm
Zero-Dispersion slope		≤0.092ps/(nm$_2$*km)
Mode field diameter @ 1310nm		9.2±0.4μm
Mode field diameter @ 1550nm		10.4±0.8μm
PMD	Max. value for fiber on the reel	0.2ps/km 1/2
	Max. Designed value for link	0.08ps/km 1/2
Cable cutoff wavelength,λ cc		≤1260nm
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℃)	≤0.5dB/km
Dry heat induced attenuation(85±2℃,30days)	≤0.5dB/km
Water immersion induced attenuation(23±2℃,30days)	≤0.5dB/km
Damp heat induced attenuation(85±2℃,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

Construction：

1. Outer sheath (HDPE)
2. Strength member (aramid yarns)
3. Gel in loose tube

CSM(FRP)

4. Water blocking yarns
5. Water blocking tape
6. Ripcord x 2

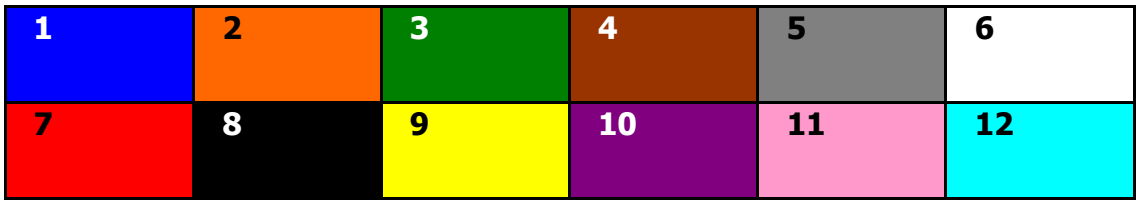
Fiber Number	6	12	24	48	72	96	144	288
No of loose tube / filler No. （Total 5tube）	1/5	2/4	4/2	4/2	6/0	8/0	12	14
Fiber No. per tube	6	6	6	12	12	12	12	12
Loose tube material	PBT							
Central strength member	FRP						FRP+PE Coated	
Addtional strength member	Aramid yarn							
Water blocking	Water swellable tape around cable core Water block yarn around cable core							
Gel	Gel filling compound in loose tube							
Outer sheath material	HDPE							
Cable OD (mm）	9.4				10.5	12.8	15	19.2
Cable weight (10%) kg/km	65				89	126	175	272
Operation temperature range	-40 ℃ to + 70 ℃							
Installation temperature range	-20 ℃ to + 60 ℃							
Transport and storage temperature range	-40 ℃ to + 70 ℃							
Span	100meter							
Tensile resistance MAT (N)	1800				1800	2300	3200	6000
Sag	1.0%							
Wind speed	120km/h							

Crush resistance	1000N /10cm
Minimal installation bending radius	20 x OD
Minimal operation bending radius	10 x OD

COLOR IDENTIFICATION OF FIBER

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

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



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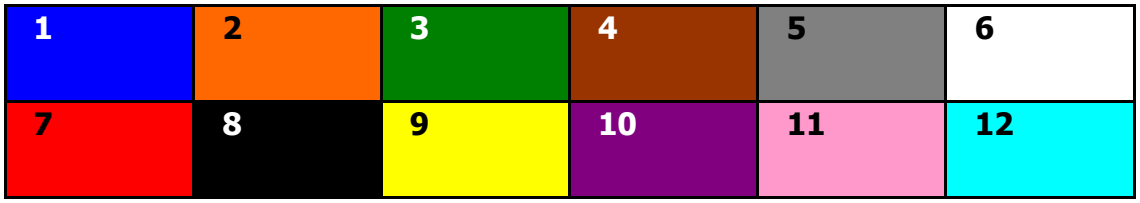
COLOR IDENTIFICATION OF LOOSE TUBE

shall be marked by a coloured coating with 12 different colours

according to EIA/TIA 598: Fibre #1: Blue
Fibre #2: Orange
Fibre #3: Green
Fibre #4: Brown
Fibre #5: Slate (Grey)
Fibre #6: White
Fibre #7: Red
Fibre #8: Black (natural with being marked
Fibre #9: Yellow
Fibre #10: Violet
Fibre #11: Rose (Pink)
Fibre #12: Aqua (Light Blue)



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℃
Test result	No damage to outer jacket and inner elements

4.7 Temperature cycling Test

Test Standard	IEC 60794-1-2 F1
Temperature step	+20℃ →-40℃ →+85℃→+20℃
Time per each step	Transition from 0 ℃ to -40 ℃ :2hours; duration at -40 ℃ :8 hours; Transition from -40 ℃ to +85 ℃ :4hours; duration at +85 ℃ :8 hours; Transition from +85 ℃ to 0℃:2hours
Cycles	5
Test result	Attenuation variation for reference value (the attenuation to be measured before test at +20±3℃) ≤ 0.05 dB/km

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 ℃
Duration	24 hrs
Test result	No filling compound shall drip from tubes

5. PACKING AND DRUM

T 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.