

TECNICAL SPECIFICATION

1. GENERAL

1.1 SCOPE

Cable type	Application
Micro cable with larger tensile strength	Duct use & Air blown application

1.2 REFERENCE

The cable provided by SUMEC need to pass the following international specifications:

IEC 60793-1	Optical fiber Part 1: Generic specifications
IEC 60793-2	Optical fiber Part 2: Product specifications
IEC 60794-1	Optical fiber cable Part 1-2: Generic specification-basic optical cable test procedures
IEC 60794-5	Optical fiber cables- Part 5: sectional specification -Microduct cabling for installation by blowing
ITU-T G.650	Definition and test methods for the relevant parameters of single-mode fibers
ITU-T G.657	Characteristics of a bending-loss insensitive single-mode optical fiber
EIA/TIA 598	Color code of fiber optic cables

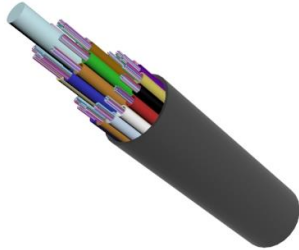
2. OPTICAL FIBER

G657A2		
Category	Description	Specifications
Optical Specifications	Attenuation @1310 nm	≤0.40dB/km
	Attenuation @1550 nm	≤0.30 dB/km
	Zero Dispersion Wavelength	1300~1324 nm
	Zero Dispersion Slope	≤ 0.092 ps/nm ² ·km
	Cable Cutoff Wavelength (λ _{cc})	≤1260 nm
	Macro bending Loss (10 turns; Φ30 mm) @1550 nm	≤ 0.03 dB
	(10 turns; Φ30 mm) @1625 nm	≤ 0.1 dB
(1 turns; Φ20 mm) @1550 nm	≤ 0.1 dB	
(1 turns; Φ20 mm) @1625 nm	≤ 0.2 dB	
(1 turns; Φ15 mm) @1550 nm	≤ 0.5 dB	
(1 turns; Φ15 mm) @1625 nm	≤ 1.0 dB	
Mode Field Diameter @1310 nm	(8.6~9.2)±0.4μm	
Dimensional Specifications	Cladding Diameter	125±0.7μm
	Cladding non circularity	≤1.0%
	Core/clad concentricity error	≤0.5μm
Mechanical Specifications	Proof stress	≥0.69GPa

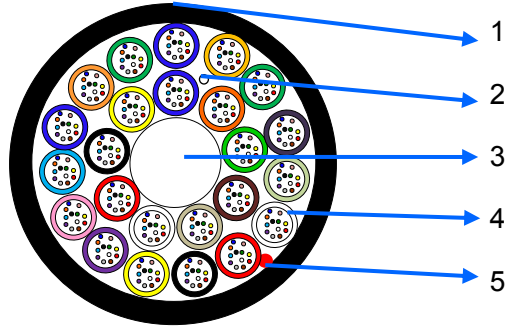
G652D Fiber		
Category	Description	Specifications
Optical Specifications	Attenuation @1310 nm	≤0.40 dB/km
	Attenuation @1550 nm	≤0.30 dB/km
	Zero Dispersion Wavelength	1300~1322 nm
	Chromatic dispersion @1310nm @1550nm @1625nm	≤3.5 ps/(nm·km) ≤18 ps/(nm·km) ≤22 ps/(nm·km)
	Zero Dispersion Slope	≤0.092 ps/nm ² ·km
	PMD _Q	≤0.2 ps/√km
	PMD individual value	≤0.2 ps/√km
	Cable Cutoff Wavelength (λ _{cc})	≤1260 nm
	Macro bending Loss (100 turns; Φ60 mm) @1625 nm	≤ 0.10 dB
	Mode Field Diameter @1310 nm	9.2±0.4μm
Dimensional Specifications	Cladding Diameter	125 ±1μm
	Coating diameter	245 ±10μm
	Core/clad concentricity error	≤0.6μm
	Cladding Non-Circularity	< 1.0%
Mechanical Specifications	Proof stress	≥0.69Gpa

3. CABLE STRUCTURE

3.1 CABLE TYPE: GYCFY



Three-dimensional schematic



Features & Application

- Small diameter
- Semi-dry water blocking
- Perfect cable structure
- Easy for blowing
- Saving the source of duct

Construction:

1. Outer sheath (**HDPE, Black**)
2. Water blocking yarns
3. Central strength member (**FRP, there are PE coated if necessary**)
4. Loose tube, fiber and jelly
5. Ripcord

Dimensions and Properties

Physical	Fiber type	G657A2 or G652D								
	Fiber count	24	36	48	72	96	144	288	432	576
	Fiber No. per tube	12	12	12	12	12	12	12	24	24
	Tube No./Filler No.	2/4	3/3	4/2	6/0	8/0	12/0	9/0-15/0	6/0-12/0	9/0-15/0
	Cable OD(mm)	6.8±0.3	6.8±0.3	6.8±0.3	6.8±0.3	7.7±0.3	9.6±0.3	10.8±0.3	13.5	15.7
	Cable weight(kg/km)	36	36	36	36	52	84	108	148	200
Properties	Operation temperature range	-30 °C to + 65 °C								
	Installation temperature range	-10 °C to + 55 °C								
	Transport and storage temperature range	-30 °C to + 65 °C								
	Max. tensile load(N)	1000			2000		2500			
	Crush resistance(N/10cm)	1000								
	Minimal installation bending radius	20*D								
	Minimal operation bending radius	10*D								

D =cable diameter

Note : The nominal /minimum thickness of the sheath is 1.2/1.0mm

Color code scheme:

Fiber color	blue	orange	green	brown	slate	white	red	black	yellow	violet	pink	aqua
Tube color	blue	orange	green	brown	slate	white	red	black	yellow	violet	pink	aqua

Note: Stripes will be used after more than 12 colors of loose tubes.

Ring will be used after more than 12 fibers in a tube.

4. TEST REQUIREMENTS

Fiber test standard

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

Performance Testing List

4.1 Tension Loading Test

Test Standard	IEC 60794-1-21 E1
Sample length	No less than 50 meters
Load	MAT
Duration time	1 minutes
Test results	After test, additional attenuation $\leq 0.1\text{dB}$
	No damage to outer jacket and inner elements

4.2 Crush/Compression Test

Test Standard	IEC 60794-1-21 E3
Load	1000N
Duration time	1minute
Test number	3
Test results	After test, additional attenuation $\leq 0.1\text{dB}$

	No damage to outer jacket and inner elements under short term load
--	--

4.3 Impact Resistance Test

Test Standard	IEC 60794-1-21 E4
Impact energy	3J
Radius	12.5mm
Impact points	5
Impact number	1
Test result	After test, additional attenuation $\leq 0.1\text{dB}$
	No damage to outer jacket and inner elements

4.4 Repeated Bending Test

Test Standard	IEC 60794-1-21 E6
Bending radius	20*D
Cycles	25 cycles
Load	150N
Test result	After test, additional attenuation $\leq 0.1\text{dB}$
	No damage to cable elements

4.5 Bend Test

Test Standard	IEC 60794-1-21 E11
Mandrel diameter	20*D
Turn number	3
Cycles	4
Test result	After test, additional attenuation $\leq 0.1\text{dB}$
	No damage to outer jacket and inner elements

4.6 Torsion/Twist Test

Test Standard	IEC 60794-1-21 E7
Sample length	1m
Angles	± 180 degree
Load	150N
Cycles	10
Test result	After test, additional attenuation $\leq 0.1\text{dB}$

	No damage to cable elements
--	-----------------------------

4.7 Abrasion

Test Standard	IEC 60794-1-21 E2B
Experiment method	The wool felt should be thoroughly impregnated with water
Frequency	6-12cycles/min
Load	20N
Cycles	10
Test result	The marking should be legible after test

4.8 Cable kink

Test Standard	IEC 60794-1-21 E10
Min. Loop diameter	Operating: 10*D, Installation:20*D
Test result	No kink occur

4.9 Water penetration Test

Test Standard	IEC 60794-1-22 F5
Height of water column	1m
Sample length	3m
Test time	24 hour
Test result	No water seepage from the opposite end of the sample

4.10 Temperature cycling Test

Test Standard	IEC 60794-1-22 F1
Temperature step	+20°C→-30°C →+65°C→20°C
Time per each step	At least 8 hours
Cycles	2
Test result	Attenuation variation for reference value (the attenuation to be measured before test at +20±3°C) ≤0.15dB/km

4.11 Environmental performance

Test Standard	RoHS
Test result	Pass the test.

Remark:The test wavelength is 1550 nm