TECNICAL SPECIFICATION

1. GENERAL

1.1 SCOPE

Cable type	Application
GYCFY	Air blowing installation cable

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

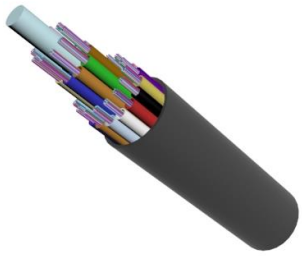
2. OPTICAL FIBER

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 ±5μm / 200 ±5μm
	Core/clad concentricity error	≤0.6μm
	Cladding Non-Circularity	＜1.0%
Mechanical Specifications	Proof stress	≥0.69Gpa

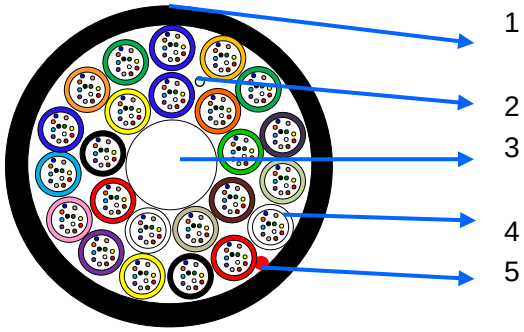
3. CABLE STRUCTURE

3.1 CABLE TYPE: GYCFY

- Easy for blowing
- Saving the source of duct



Three-dimensional schematic



Construction:

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

Features & Application

- Small diameter
- Semi-dry water blocking
- Perfect cable structure

Dimensions and Properties

Physical	Fiber type	250μm				200μm			
	Fiber count	72	96	144	288	72	96	144	288
	Fiber No. per tube	12	12	24	12	12	12	24	12
	Tube No./Filler No.	6/0	8/0	6/0	9/0-15/0	6/0	8/0	6/0	9/0-15/0
	Loose tube (mm)	1.4±0.05	1.4±0.05	2.3±0.05	1.4±0.05	1.2± 0.05	1.2± 0.05	1.75± 0.05	1.2± 0.05
	Strength member diamerer (mm)	1.5±0.1	2.4±0.1	2.2±0.1	2.8±0.1	1.2±0.1	2.1±0.1	1.8±0.1	2.4±0.1
	Cable OD(mm)	5.3±0.3	6.2±0.3	7.7±0.3	9.6±0.3	4.4±0.3	5.5±0.3	6.3±0.3	7.7±0.3
	Cable weight(kg/km)	26	33	52	80	16	26	43	58
Properties	Operation temperature range	-30 ℃ to + 65 ℃							
	Installation temperature range	-10 ℃ to + 55 ℃							
	Transport and storage temperature range	-30 ℃ to + 65 ℃							
	Max. tensile load(N)	700	1000			500	1000		
	Crush resistance(N/10cm)	500							
	Minimal installation bending radius	20*D							
	Minimal operation bending radius	10*D							

D =cable diameter

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.

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	Fiber strain≤0.6% Additional attenuation ≤0.05dB
	No damage to outer jacket and inner elements

4.2 Crush/Compression Test

Test Standard	**IEC 60794-1-21 E3**
Load	500N
Duration time	1minute
Test number	3
Test results	No change in additional attenuation after test
	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	No change in additional attenuation after test
	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	No change in additional attenuation after test
	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, no change in additional attenuation
	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	No change in additional attenuation after test
	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	1m
Test time	24 hour
Test result	No water seepage prom the opposite end of the sample

4.10 Temperature cycling Test

Test Standard	**IEC 60794-1-22 F1**
Temperature step	+20℃→-30℃ →+65℃→20℃
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℃) ≤0.10dB/km

4.11 Environmental performance

Test Standard	**RoHS**
Test result	Pass the test.

Remark: “No change in additional attenuation” is considered as the addition attenuation≤0.03dB,

The test wavelength is 1550 nm.