

Optical fiber / Loose tube / Gel filled / PE outer jacket / All dielectric / Microduct

Standards

ITU-T G.652.D, G.657.A1
IEC 60793, 60794-1-2, 60794-5-10
ISO 9001:2015, 14001:2015
TIA 598-D
GR 20 Core compliant glass



Application

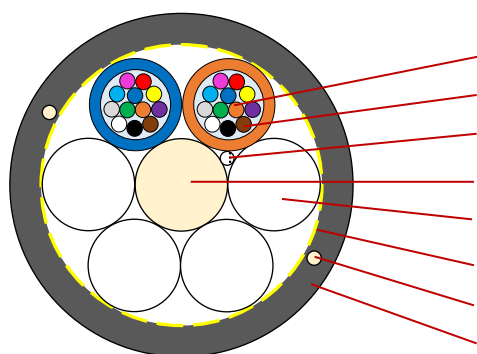
Microduct
Local area network
Long haul communication system
Junction communication system
Communication link

Features

Installation in microduct by air pressure
Small diameter & Light weight
Distinguishable by color of fiber & Loose tube
Essential for moisture protection
UV-resistant outer jacket

Cable Cross Section

In case of 24 fiber cable



Optical fiber
Gel filled tube: PBT and thixotropic gel
Dry block(s): Water blocking yarn in core
Central strength member: FRP (PE coated, if necessary)
Filler: Natural color
Binder(s): Water blocking binder
Ripcord(s)
Outer jacket: Black color HDPE

Cable Construction

Fiber count	Unit position	Active tube	Fibers per tube	Nominal cable outer diameter		Nominal cable weight	
				inch	mm	lbs/kft	kg/km
12 ~ 72	6	1 ~ 6	12	0.217	5.5	16	25
96	8	8	12	0.256	6.5	25	35
144	12	12	12	0.315	8.0	37	55

Fiber Characteristics for Single Mode Fiber

Fiber type	ITU-T G.652.D	Compliant with ITU-T G.652.D and G.657.A1
Mode field diameter (MFD)	9.2 μ m $\pm$ 0.4 μ m @1310 nm	8.9 μ m $\pm$ 0.4 μ m @1310 nm
Mode field concentricity error	$\leq$ 0.8 μ m	
Cladding diameter	125 μ m $\pm$ 1 μ m	
Cladding non-circularity	$\leq$ 1.0 %	
Coating diameter	245 μ m $\pm$ 15 μ m	
Attenuation	$\leq$ 0.35 dB/km @ 1310 nm, $\leq$ 0.35 dB/km @ 1383 nm, $\leq$ 0.25 dB/km @ 1550 nm	
Chromatic dispersion	$\leq$ 3.5 ps/(nm·km)@ 1310 nm, $\leq$ 18 ps/(nm·km)@ 1550 nm	
Cable cut-off wave length	$\leq$ 1260 nm	
Zero dispersion wavelength	1300 ~ 1324 nm	
Zero dispersion slope	$\leq$ 0.092 ps/nm ² .km	
Proof test	Nom. 100 kpsi	

Fiber and Tube Identification

Color code	01~12	Blue	Orange	Green	Brown	Grey	White	Red	Black	Yellow	Violet	Pink	Aqua
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Cable Identification

Jacket Marking	Method	Hot foil Indent or inkjet printing with white color											
	General sequence	Customer (Upon request), Fiber type, Fiber count, Cable type, Serial number (#####), Manufacturer, Manufacture year (YYYY), Length marking (Every 1m or 2ft)											
	Example	0000M SM 24F MICRODUCT CABLE 0001 GAON CABLE 2024 0001M											

Cable Handling

Pulling tension(N)		12~72F : 250N, 96F : 350N, 144F : 550N
Bending radius		20 X Cable diameter (With load), 10 X Cable diameter (Without load)
Temperature range	Installation	- 14 °F ~ 140 °F (- 10 °C ~ + 60 °C)
	Operation	- 22 °F ~ 140 °F (- 30 °C ~ + 60 °C)
	Storage, Transport	- 22 °F ~ 140 °F (- 30 °C ~ + 60 °C)

Cable Packing

Drum	Material	Plywood drum fastened on a pallet or wooden drum with wood bars lagging
	Length	Standard 13,124 ft (4,000 m)

Mechanical & Environmental Tests (Based on IEC 60794-5-10)

Test items	Test method	Description	Acceptance criteria ¹⁾
Tensile strength	IEC 794-1-2 E1	≥ 50 m, 40 D ²⁾ , Load: 1 W ³⁾ , 60 min	Reversible, after test
Crush resistance	IEC 794-1-2 E3	500 N / 100 mm plate, 1 min	Reversible, after test
Impact resistance	IEC 794-1-2 E4	1J, 3 different points (interval: ≥ 500 mm)	Residual increase, < 0.1 dB/km
Repeated bend	IEC 794-1-2 E6	40 D, 25 N, 25 cycles, ± 90°	No damage to sheath and cable elements
Torsion	IEC 794-1-2 E7	2m sample, 40N, 10 cycles, ± 180°	Reversible, after test
Kink	IEC 794-1-2 E10	40 D	No damage to the cable
Cable bend	IEC 794-1-2 E11	40 D, U shape 4 turns, ± 180°	Reversible, after test
Temperature cycling	IEC 794-1-2 F1	≥ 1,000 m sample, soak: 8 h, 2 cycles, + 23 °C, - 30 °C, + 60°C, + 23 °C	Δ ≤ 0.15 dB/km (Measure during the last cycle)
Water penetration	IEC 794-1-2 F5	3m sample, 1m height, 24 h	No leakage

¹⁾ It shall be measured at 1550nm for single mode fiber. The acceptance measurement equipment error is 0.05dB.

²⁾ Cable diameter

³⁾ Cable weight per length (kg/km)

Part number

Description		MC – <u>P1</u> – <u>P2</u> – <u>P3</u> – <u>P4</u> – <u>P5</u> – <u>P6</u> – <u>P7</u> – <u>P8</u>	
Fiber type	<u>P1</u>	D: G.652.D	A1: G.657A1
Fiber count	<u>P2</u>	12 ~ 144	
Tube material	<u>P3</u>	P: PBT	
Fibers per tube	<u>P4</u>	A: 12	
Construction	<u>P5</u>	SN: Single jacket non armor	
Jacket material	<u>P6</u>	HD: HDPE	
Length unit	<u>P7</u>	F: Feet	M: Meter
Special requirements	<u>P8</u>	O: No special requirement	

Example (Micro duct cable, G.652.D, 24F cable, PBT tube, HDPE jacket, Feet unit): **MC-D-24-P-A-SN-HD-F-O**

History

Revised number	Date	Description
1	Mar. 19, 2021	Update crush resistance & impact resistance
2	Apr. 15, 2021	Change temperature range and temperature cycling test
3	Oct. 25, 2021	Add part number
4	Nov. 08, 2023	Correct mistyping
5	Oct. 31, 2024	Adding 652.D fiber
6	Nov. 29, 2024	Changing packing method