

GF HD-001

Microduct cable – High density version

Revised: 3

Optical fiber / Loose tube / 24F per tube / Gel filled / PE outer jacket / Microduct

Standards

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



Application

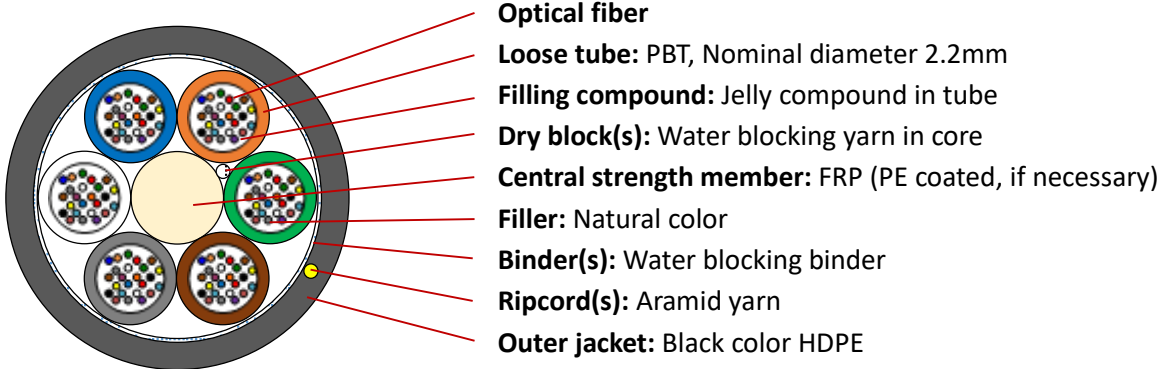
Microduct
Local area network
Long haul communication system
Junction communication system
Communication link

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 144C fiber cable



Cable Construction

Fiber count	Unit position	Active tube	Fibers per tube	Nominal cable outer diameter		Nominal cable weight	
				inch	mm	lbs/kft	kg/km
24 ~ 144	6	1 ~ 6	24	0.315	8.0	34	50
288	12	12	24	0.492	12.5	84	125

Fiber Characteristics for Single Mode Fiber

Fiber type	ITU-T G.652D	ITU-T G.657A1
Mode field diameter (MFD)	9.2 $\mu\text{m} \pm 0.4 \mu\text{m}$ @1310 nm	8.9 $\mu\text{m} \pm 0.4 \mu\text{m}$ @1310 nm
Mode field concentricity error	$\leq 0.8 \mu\text{m}$	
Cladding diameter	125 $\mu\text{m} \pm 1 \mu\text{m}$	
Cladding non-circularity	$\leq 1.0 \%$	
Coating diameter	245 $\mu\text{m} \pm 15 \mu\text{m}$	
Attenuation	$\leq 0.35 \text{ dB/km}$ @ 1310 nm $\leq 0.35 \text{ dB/km}$ @ 1383 nm $\leq 0.25 \text{ dB/km}$ @ 1550 nm	
Chromatic dispersion	$\leq 3.5 \text{ dB/km}$ @ 1285 ~ 1330 nm $\leq 18 \text{ dB/km}$ @ 1550 nm	
Cable cut-off wave length	$\leq 1260 \text{ nm}$	
Zero dispersion wavelength	1300 ~ 1324 nm	
Zero dispersion slope	$\leq 0.092 \text{ ps/nm}^2.\text{km}$	
Proof test	Nom. 100 kpsi	

Fiber & Tube Identification

Color code	#1 ~ #12	Blue	Orange	Green	Brown	Grey	White	Red	Black	Yellow	Violet	Pink	Aqua
	#13 ~ #24	Blue *	Orange *	Green *	Brown *	Grey *	White *	Red *	Natural *	Yellow *	Violet *	Pink *	Aqua *

*: Fiber with black color dots

Temperature Range

Installation	14 °F ~ 140 °F (- 10 °C ~ + 60 °C)
Operation, Storage, Transport	- 22 °F ~ 140 °F (- 30 °C ~ + 60 °C)

Cable Bend radius & Marking & Packing

Bend radius	20 X Cable diameter (With load), 10 X Cable diameter (Without load)	
Marking	Sequence	Customer (Upon request), Part number, Serial number (4~5 digits), Fiber type, Fiber count, Manufacturer, Manufacture year (YYYY), Length marking (Every 2 feet or 1mtrs)
	Example	HD-9E-144-P-B-SN-HD-F-0 00001 G652D 144F GAON CABLE 2021 00002FT
	Method	Hot foil indent (White color)
Packing	Length	Standard 13,000 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	Δ ≤ 0.15 dB, after test
Impact resistance	IEC 794-1-2 E4	4.9 N.m, 3 different points (interval: ≥ 500 mm)	Δ ≤ 0.15 dB, after test
Repeated bend	IEC 794-1-2 E6	40 D, 50 N, 25 cycles, ± 90°	No damage to sheath and cable elements
Torsion	IEC 794-1-2 E7	2m sample, 50N, 10 cycles, ± 180°	Reversible, after test
Kink	IEC 794-1-2 E10	40 D	No kink
Cable bend	IEC 794-1-2 E11	40 D, 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 0.02dB.

²⁾ Cable diameter

³⁾ Cable weight per length (kg/km)

Part number

Description		HD – <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>	9E: G.652D	A1: G.657A1
Fiber count	<u>P2</u>	24 ~ 288	
Tube material	<u>P3</u>	P: PBT	
Fibers per tube	<u>P4</u>	B: 24	
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 (SJNA, 652D, 144F cable, PBT tube, HDPE jacket, FT unit): **HD-9E-144-P-B-SN-HD-F-O**

Revised Record

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