Multi-core Fiber Fan-in&Fan-out Devices

The series of multi-core fiber fan-in and fan-out devices are designed and manufactured using a unique process. They have the advantages of low loss, low crosstalk and low loss difference between cores. They perfectly match the multi-core optical fiber developed by our company and are ideal for realizing fiber core multiplexing and solution. Multiplexed key components are widely used in data centers and optical fiber sensing fields. It can provide complete low-loss coupling solutions and customized services for different multi-core optical fibers.

Features

- Number of cores: 2, 3, 4, 7, 8,19
- Insertion Loss<1.5dB
- High data rates
- Various Package Dimensions Available
- Scalable manufacturing technique

Application

- 2D bend sensing
- Next-generation optical amplifiers
- Active Optical Cables (AOC)
- Down hole sensing in oil exploration applications
- Photonic Integrated Circuits
- Pipeline monitoring
- Distributed sensing

1. How Multi-core Fiber Fan out Works

Current optical communication network grows in a ratio of 20% to 60%, but single core fiber system has many limitations. Thus, breaking through the communication system capacity limit, Multi-core Fiber Fan-out gradually becomes the inevitable choice in the industry. Multi-core fiber (MCF) has multiple fiber cores in a common cladding area. Its fiber density can be increased by many times. To connect a single core fiber into a multi-core fiber, MCF fiber fan-out is needed. Multi-core fiber fan-out cable is designed to guide light from a 4/7/8 core fiber into 4/7/8 separate SMF28 fiber pigtail.

2. Specifications

Product type	4 cores	7 cores	8 cores
Fiber type	MCF 4-42/125/250	MCF7-42/150/250(SM)	MCF8-42/150/250(SM)
Type description	Homogeneous low crosstalk multi-core optical fiber		
Working wavelength	1450~1700 nm	1250~1370 nm	
Multi-core fiber attenuation	≤0.3dB/km@1550	≤0.5dB/km	
Multi-core optical fiber dispersion	≤22 ps/nm·km	/	
Crosstalk between cores (dB)	≤ -45dB/km @Adjacent cores		
Mode field diameter	9.5±0.5μm@1550nm	8.5±0.5μm@1310nm	
core diameter	8.0±0.5μm		
Core spacing	41.5±0.5μm		
Cladding diameter	125μm	150μm	150μm
Coating layer diameter	250μm		
Single fan-in fan-out Device loss	≤1dB	≤1.5dB	≤1.5dB

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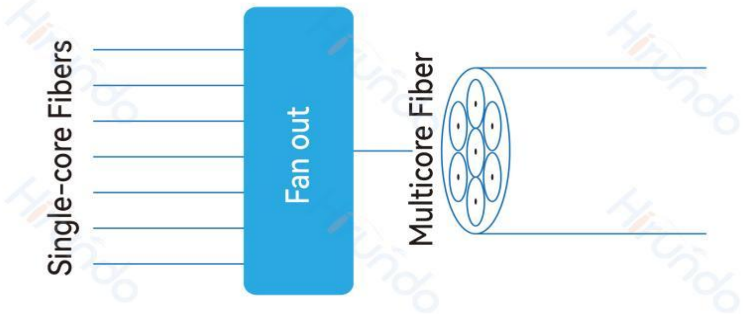
Paired fan-in fan-out Device loss	≤1.5dB	≤3dB	≤3dB
back reflection	≤-55dB		
crosstalk	≤-50dB		
Fiber core arrangement	square	regular hexagon	ring
Single mode fiber type	G652.D		
Multi-core fiber pigtail length	1±0.05m		
Single mode fiber length	1±0.05m		
Fiber optic cable	0.9mmloose tube		
Connector type	FC/APC/UPC SMF；LC/UPC MCF		
Package size	Φ15x40mm	Φ15x80mm	
working temperature	0~75℃		

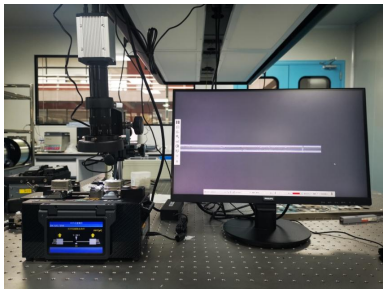
3. Technical introduction

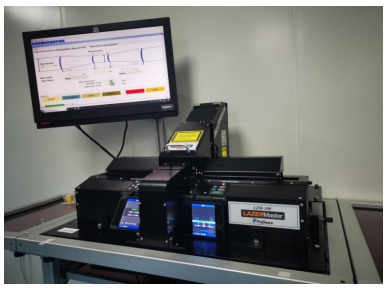
Multi-core fiber fan-in and fan-out devices are prepared using fused tapering technology. Specially designed bridge fibers are inserted into the glass tube according to the arrangement of the multi-core fibers for adiabatic tapering. The tapering ratio is controlled according to the core spacing of the target multi-core fiber. . After the device is tapered, it is cut at a small angle and fused and packaged with the target multi-core optical fiber to obtain a multi-core optical fiber fan-in and fan-out device.



4. Production capacity introduction:

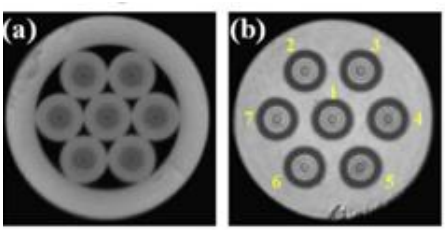
Hirundo has a full set of Fujikura's optical fiber device preparation related equipment, including CO2 laser fiber workstation (LZM100, Fujikura), polarization-maintaining fiber fusion splicer (100P+, Fujikura), large core diameter cutting knife (CT116, CT105, Fujikura), which can be Produce 500 pieces of multi-core optical fiber fan-in and fan-out devices.

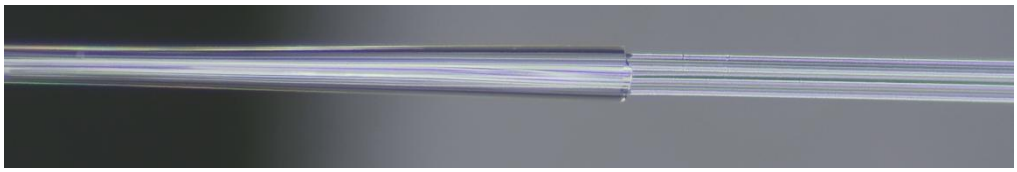




5. Application examples

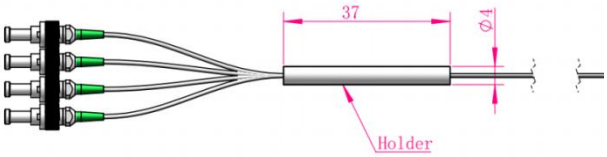
Seven-core optical fiber fan-in fan-out device end face and seven-core optical fiber



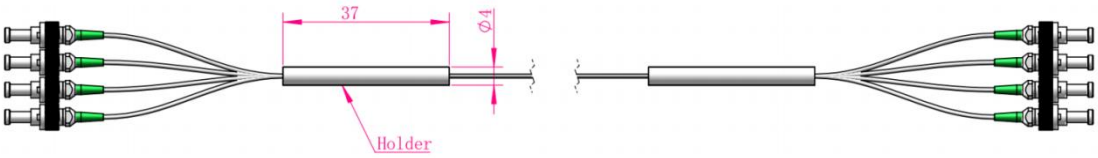


6. Structure Examples

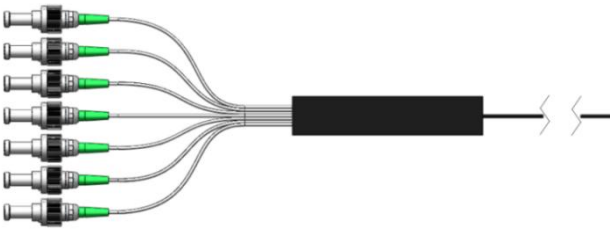
4C MCF Single Fan out -FC/APC



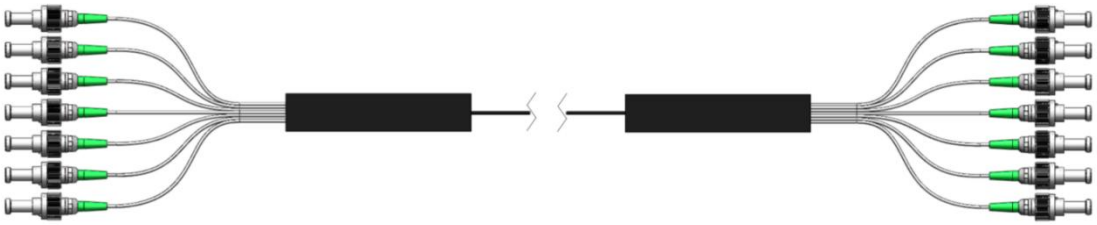
4C MCF Fan out pairs- FC/APC



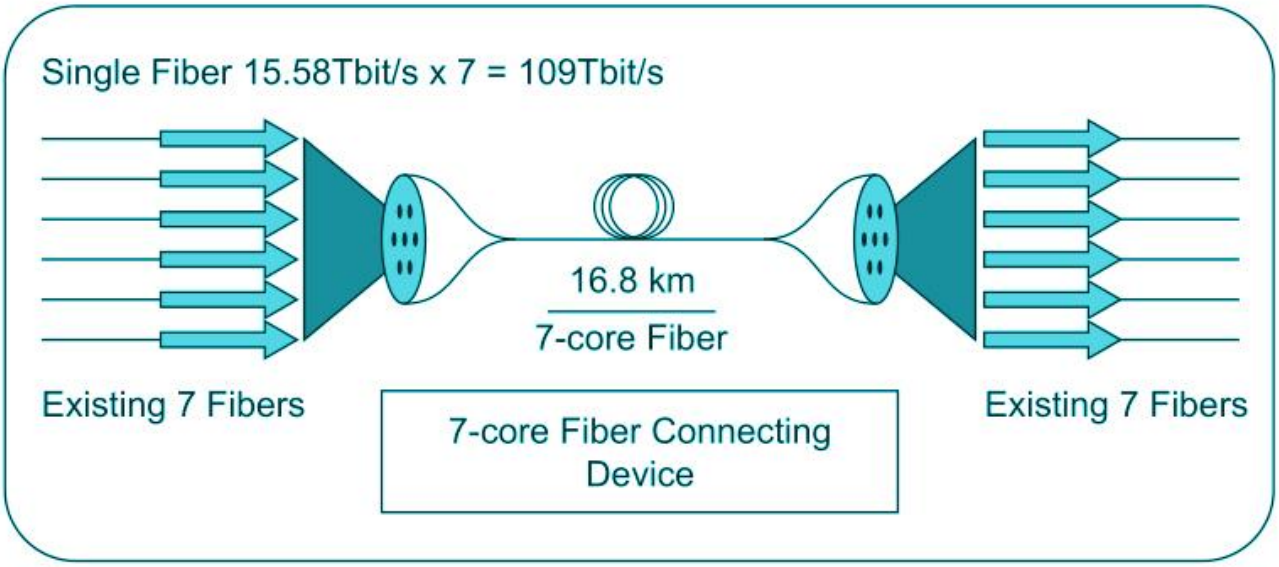
7C MCF Single Fan outs -FC/APC



7C MCF Fan out pairs -FC/APC



7. MCF Transmission System



Order information:

Multi-core Fiber Fan-in&Fan-out PN：MCF-FIFO-XXXXXXX-XX （MCF-FIFO+7 Code+2 Serial Number）

MCF-FIFO	XX	X	X	X	X	X	XX
	Multi-core fiber	**Package**	**Fiber core arrangement**	**Single mode fiber type**	**Jacket Type**	**Connector**	
	04 4 cores **07** 7 cores **08** 8 cores **0S** Special	**1** Φ15x40mm **2** Φ15x80mm **S** Special	**1** square **2** regular **3** ring	**0** G652D **1** G657A1 **2** G657A2 **3** G657B3 **4** 1310 PM **5** 1550 PM **6** 62.5/125 **7** 50/125 **S** Special	**1** 250um bare fiber **2** 900um loose tube	**0** none **1** SC/UPC **2** SC/APC **3** FC/UPC **4** FC/APC **5** LC/UPC **6** LC/APC **7** ST/UPC **S** Special	**SN**