FAQ

OM5 WIDE BAND MULTIMODE OPTICAL FIBER

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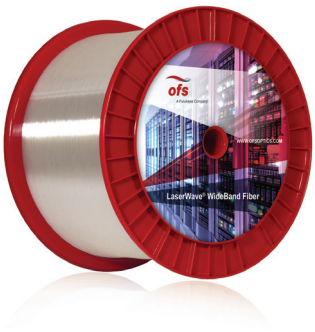
What is OM5 wide band multimode optical fiber?

OM5 wide band multimode optical fiber (WBMMF) is a new fiber type that extends the ability of conventional OM4 multimode fiber to support multiple wavelengths. Unlike traditional multimode, which is designed to support transmission only at 850 nanometers (nm), WBMMFs, including OFS LaserWave® WideBand Optical Fiber, support traffic from 850 to 950 nm. This capability enables transmission over multiple wavelengths using the same strand of fiber, using technology called wavelength division multiplexing (WDM). This significantly increases the capacity of a multimode fiber while maintaining its cost advantages for short reach applications.



What were the drivers behind the integration of SWDM into multimode optical fiber?

In order to increase transmission speeds up to 10/25 gigabits per second (Gb/s), transceiver vendors simply increased the speed of their devices (lasers and detectors). When 40 and 100 Gb/s standards were developed, transmission schemes that used parallel fibers were introduced. This increase in fiber count provided a simple solution to limitations of the technology available at the time. It was well accepted in the industry and allowed multimode links to maintain their link cost advantage. Increasing the number of fibers is practical to a point, but too many fibers can become unwieldly due to cable management challenges. Consequently, the industry developed WDM technology that operated at shorter wavelengths (SWDM). At today's higher speeds, SWDM can provide cost effective solutions that include duplex 100 Gb/s links, and a logical migration path from 40 to 400 Gb/s.

What products take advantage of WBMMF's capabilities?

There are a number of proprietary and Multi-Source Agreement (MSA) transceivers available today that take advantage of WBMMF, including two-wavelength Bi-Directional (BiDi) and four wavelength SWDM4 products. Both 40 and 100 Gb/s transceivers operating over a pair of fibers are available. In July 2018, a 400 Gb/s BiDi MSA group was created to develop specifications for a low cost 400 Gb/s, two-wavelength, 8-fiber multimode optical link.

What were the main technical challenges to be overcome?

The biggest issue on the fiber side was widening the usable wavelength range of the fiber. Typically, a multimode fiber is "peaked" for the highest bandwidth at a single wavelength. In the case of OM3 and OM4 fibers, that wavelength is 850 nm. Bandwidth at other wavelengths is notably less. This limits the use of SWDM with these fibers. With WBMMF and its improved waveguide design, high bandwidth is achieved across a range of wavelengths from 850 to 950 nm.

Is WBMMF backward compatible to legacy equipment, or is it intended only for use in greenfield installations?

WBMMFs like LaserWave WideBand Optical Fiber are fully compliant with OM4 specifications and will support existing applications to the same link distance, while providing OM4-like transmission capability from 850 nm to 950 nm. It is backward compatible with LaserWave *FLEX* 550 and other current 50 micron (µm) OM4 fibers. Four different wavelength ranges are available in this region, so capacity can be increased over current OM4 fiber by at least a factor of four.

What about the standards?

Multimode wide band fiber was first standardized in June 2016 by the Telecommunications Industry Association (TIA) in TIA-492AAAE. It was incorporated into the TIA cabling standard, ANSI/TIA-568.3-D in October 2016. IEC added wideband fiber in the latest revision of their fiber standard, IEC 60793-2-10 Ed. 6.0, in August 2017. The international cabling standard, ISO/IEC 11801defines the commonly used OMx multimode nomenclature. The latest revision, ISO/IEC 11801-1, Edition 1.0 was published in November 2017, and includes wide band multimode as OM5.

The recently published IEEE 802.3bs 200 and 400Gb/s Ethernet standard includes OM5 fiber as an approved media type for 400GBASE-SR4. The 100m reach is the same as OM4 fiber, as the application only operates at 850nm(not a WDM application). Similarly, draft IEEE 802.3cd (50, 100, and 200 Gb/s Ethernet) and 64 Gb/s Fibre Channel FC-PI-7also include OM5 as an approved media type, with the same reach as OM4 fiber.

The IEEE 802.3cm, 400 Gb/s over Multimode Task Force has adopted two baseline objectives for 400 Gb/s transmission over multimode fiber, one using eight fibers and two wavelengths and one using a single wavelength and 16 fibers. The two wavelength baseline will be the first standard that takes advantage of OM5 fiber's multi-wavelength capacity, with an OM5 reach objective of 150 meters.

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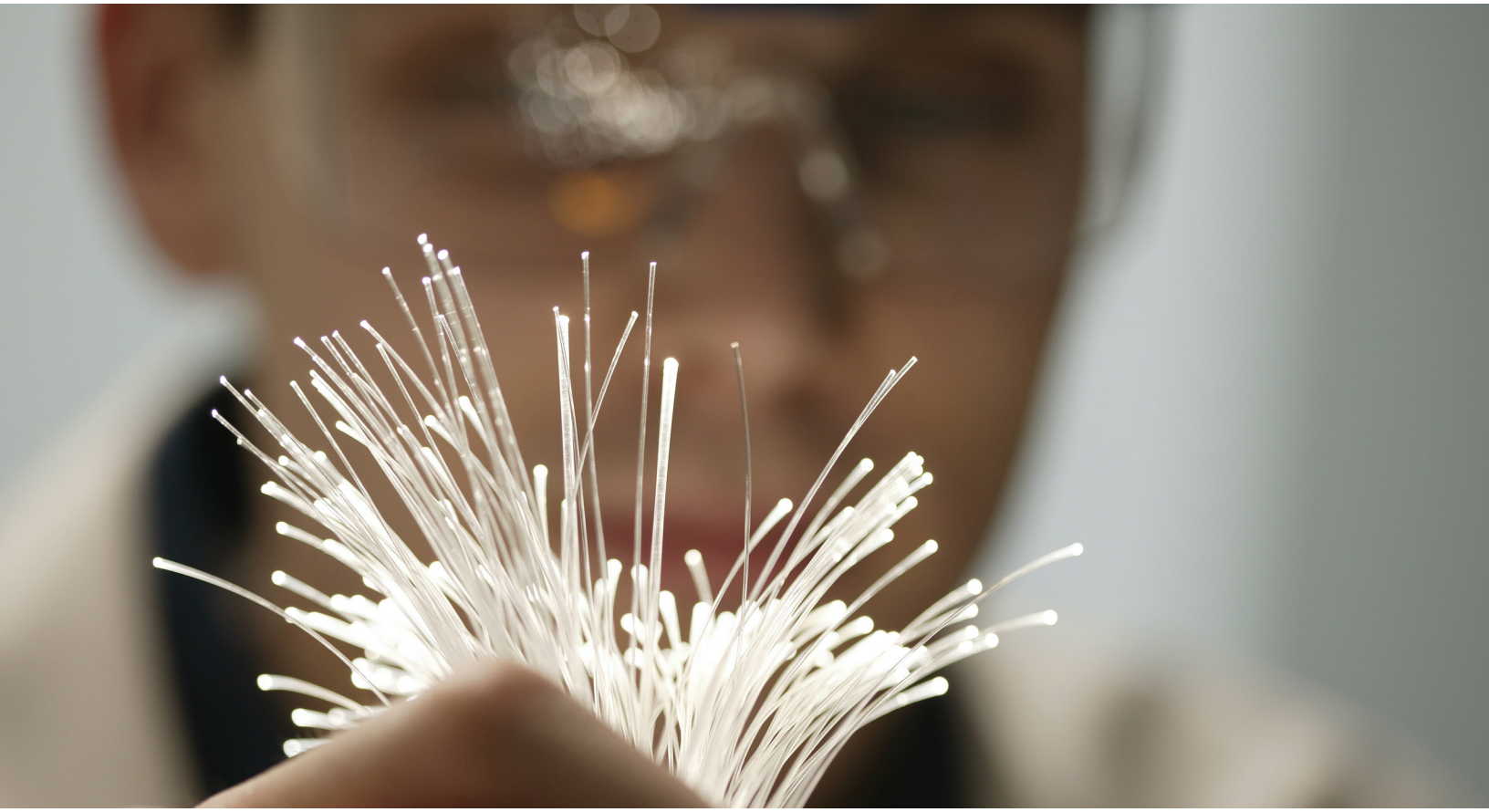

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