



LaserWave® *FLEX* Bend-Optimized Fiber

Optical Fiber in the Enterprise

Optical fiber installations in the enterprise are becoming larger and denser. Data centers, high-performance computing centers and LAN backbones are migrating to optical fiber for its higher bandwidth, lower power consumption, and greater port density. As fiber moves deeper into these applications, fiber density becomes greater, and fiber management systems become larger and more burdened. Link lengths and connector counts expand, increasing link loss and decreasing system margin.

The Demand for Bend-Optimized Fiber

One common problem in large installations is improper jumper management. Cable management is typically done at the time of installation; once installed, it is relatively static. Initial jumper installation is often done by the contractor, but frequent moves and rearrangements can lead to sharply bent fibers. Additional links are often installed by data center administrators, who may not take the proper care in managing slack and properly routing jumpers.

LaserWave *FLEX* Fiber Performance Advantages

Traditional multimode fibers can be sensitive to tight bends, leading to high link loss that could exceed the system loss budget. LaserWave *FLEX* bend-optimized multimode fiber offers extremely low bending loss at both 850 nm and 1300 nm, including an industry-leading 2.2 dB/km at the 850 nm operating window, most popular for enterprise applications. It can be bent down to a radius of 7.5 mm (almost ¼ inch) with less than 0.2 dB added loss at 850 nm. At a 15 mm radius (~ ½ inch) the added loss is less than 0.1 dB - up to a 10x improvement in bend loss compared to traditional multimode fiber, significantly diminishing the threat of added loss created by tight bends.

Improving Cable Management Practices

As an added benefit, this fiber can enable new cable management designs that can reduce equipment size and allow more effective equipment cooling. By allowing tighter

bends in properly routed cable and fiber, enclosures can be smaller and create a denser cross connect. Minimizing the volume of space required for cable management enhances air flow through a rack space, improving cooling, a critical component of proper data center design.

No Substitute for Proper Installation Methods

LaserWave *FLEX* Fiber is not a solution for poor jumper and cable installation practices, however. Care must still be taken to prevent sharp kinks (bend radius tighter than 7.5 mm), which can over-stress the optical fiber, potentially leading to a mechanical failure at some point in the future.

Demonstrations showing single-mode fiber installed with sharp bends, stapled to a hard surface, and with weights hanging from the cable are eye-catching. However, these cables were designed specifically to withstand such loads and provide additional protection and tensile strength. Such cables are intended primarily for Fiber-to-the-Home (FTTH) applications with Multi-Dwelling Units (MDUs). A service outage created when these cables fail will only affect a single consumer, not a mission critical application in a data center that conducts thousands of transactions in minutes, or even seconds.

Summary

As laser-optimized multimode fiber has become the transmission medium of choice in data centers, high performance computing centers and LAN backbones, a greater density of optical fiber is being deployed in buildings than ever before. LaserWave *FLEX* multimode fiber provides new opportunities for more robust fiber installations with up to 10x better bend loss performance compared to traditional multimode fiber.



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