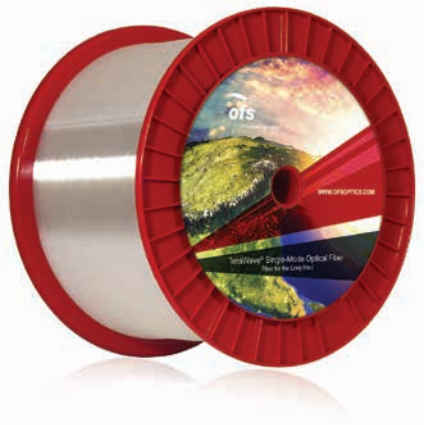
ofs
A Furukawa Company

TeraWave™ Single-Mode Optical Fiber

Fiber for the Long Haul



Features and Benefits

- Effective area of 125 μm²
- Long term attenuation and mechanical reliability
- Ultra low PMD
- Improved OSNR
- 1.5 dB increase in non-linear limit
- High performance D-Lux® Ultra Coating
- Designed for terrestrial cables
- Low optical loss across the C- and L-bands 1530 nm – 1625 nm to improve power budget
- Macrobend performance equivalent to conventional G.652.D single-mode fiber
- Tight geometric control for low splice loss

Applications

TeraWave Single-Mode Optical Fiber provides outstanding cable performance and design freedom for terrestrial long haul systems. The product provides lower system cost opportunities for coherent transmission by enabling reduced signal regeneration and/or longer spans between amplifiers.

- 100 Gb/s, 400 Gb/s, and 1 Tb/s using coherent modulation formats
- Ultra-long haul 10 Gb/s and 100 Gb/s
- Terabit super-channels
- Dense wave-division multiplexing
- Long unrepeatered spans such as those encountered in remote regions

Overview

TeraWave™ Single-Mode Optical Fiber provides an effective areas that are 49% larger than G.652.D fibers combined with an average attenuation that is lower than most G.652 fibers. These properties are designed to support coherent transmission systems operating at 100 Gb/s and beyond in the C and L band. TeraWave Fibers fall into the ITU-T G.654.B Category that was originally developed for demanding submarine systems but are now being deployed in terrestrial systems.

Product Description

TeraWave Single-Mode Optical Fiber features a 125 μm² effective area, very good cabling properties, and low loss to help provide superior optical signal-to-noise ratio (OSNR) performance in optical links compared to low loss G.652.D fibers. The fiber takes the best aspects of highly engineered submarine fibers and combines them with cabling and splicing performance that is similar to conventional single-mode terrestrial fiber. These improvements allow system designers to increase distances between amplification and regeneration sites to help reduce overall system costs. TeraWave Single-Mode Optical Fiber supports longer un-regenerated reach than conventional G.652.D fiber for any coherent modulation format and using the same transmission equipment. The higher launch power limit of TeraWave Single-Mode Optical Fiber can also be leveraged to increase hut spacing without sacrificing signal quality.

TeraWave Single-Mode Optical Fiber is Fiber for the Long Haul network - for cost effective long haul applications today, and optimized to support the long term roadmap of ever increasing data rates to 400 Gb/s and beyond. TeraWave Single-Mode Optical Fiber is manufactured using OFS' patented ZWP process with a composition of high purity synthetic silica throughout both the core and cladding.

For additional information please contact your sales representative.

You can also visit our website at www.ofsoptics.com or call 1-888-fiberhelp (1-888-342-3743) USA or 1-770-798-5555 outside the USA.

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Product Specifications	TeraWave™ Optical Fiber	
Physical Characteristics		
Clad Diameter	125.0 ± 0.7 µm	
Clad Non-Circularity	≤ 0.7 %	
Core/Clad Concentricity Error (Offset)	≤ 0.5 µm, < 0.2 µm typically	
Coating Diameter (Natural)	242 - 262 μm	
Coating-Clad Concentricity Error (Offset)	≤ 12 µm	
Tensile Proof Test (Other proof test levels available on request)	100 kpsi (0.69 GPa)	
Coating Strip Force	Range: 1.0 N ≤ CSF ≤ 9.0 N	
Standard Reel Lengths	Up to 50.4 km (31.3 miles)	
Optical Characteristics		
Attenuation	Maximum	
at 1385 nm	≤ 0.35 dB/km	
at 1550 nm	≤ 0.19 dB/km	
at 1625 nm	≤ 0.21 dB/km	
Attenuation vs. Wavelength		
Range (nm)	Reference (nm) λ	α
1525 – 1575	1550	0.03
1460 – 1625	1550	0.05
The attenuation in a given wavelength range does not exceed the attenuation of the reference wavelength (λ) by more than the value α .		
Attenuation Uniformity / Point Discontinuities at 1310 nm and 1550 nm	≤ 0.05 dB	
Macrobending Attenuation:		
The maximum attenuation with bending does not exceed the specified values under the following deployment conditions:		
Deployment Condition	Wavelength	Induced Attenuation
100 turns on 30 mm radius mandrels	1550 nm	≤ 0.1 dB
	1625 nm	≤ 0.1 dB
Chromatic Dispersion		
Chromatic Dispersion at 1550 nm	≤ 22 ps/nm-km	
Chromatic Dispersion Slope at 1550 nm	< 0.070 ps/nm^2 -km	
Group Refractive Index		
at 1550 nm	1.467	
Mode Field Diameter	12.4 ± 0.5 μm	
Effective Area at 1550	Range: 115 μm^2 to 135 μm^2	
Cable Cut-off Wavelength (λ_{CC})	≤ 1520 nm	
Polarization Mode Dispersion (PMD) [1]		
Fiber PMD Link Design Value (LDV) [2]	< 0.04 ps/$\sqrt{km}$	
Maximum Individual Fiber	< 0.1 ps/$\sqrt{km}$	
Typical Fiber LMC PMD	< 0.02 ps/$\sqrt{km}$	
Environmental Characteristics (at 1310, 1550 & 1625 nm)		
Temperature Cycling (-60° + 85 °C)	≤ 0.05 dB/km	
High Temperature Aging (85° ± 2 °C)	≤ 0.05 dB/km	
Temperature & Humidity Cycling (at -10 °C to +85 °C and 85 to ~98% RH)	≤ 0.05 dB/km	
Water Immersion (23° ± 2 °C)	≤ 0.05 dB/km	

[1] As measured with low mode coupling (LMC) technique in fiber form, value may change when cabled. Check with your cable manufacturer for specific PMD limits in cable form.

[2] The PMD Link Design Value complies with IEC 60794-3, September 2001 (N = 20, Q = 0.01%). Details are described in IEC 61282-3 TR Ed 2, October 2006.