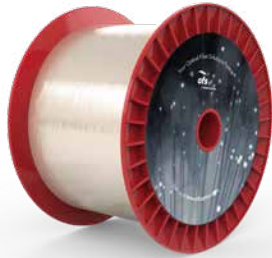




A Furukawa Company

# AllWave® ULL Single-Mode Optical Fiber

## Fiber for the Long Haul



### Features and Benefits

- Ultra low loss in 1310 and 1550-1625 nm windows
- Long term attenuation and mechanical reliability
- Ultra low PMD
- Low Latency
- High performance D-Lux® Ultra coating
- Designed for long-haul systems
- ITU-T G.652B and G.654C compliant
- Can enable higher OSNR or longer reach versus traditional ITU-T G.652.D fibers
- Supports coherent and non-coherent transmission systems
- Optimized for 100G and beyond

### Product Description

AllWave ULL (Ultra Low Loss) Single-mode Optical Fiber is an Ultra Low Loss ITU-T G.652B and ITU-T G.654.C compliant fiber designed for terrestrial optical networks.

With a 9.2µm Mode-field diameter, AllWave ULL is compatible, including low splice loss, to the embedded base of standard single-mode fiber.

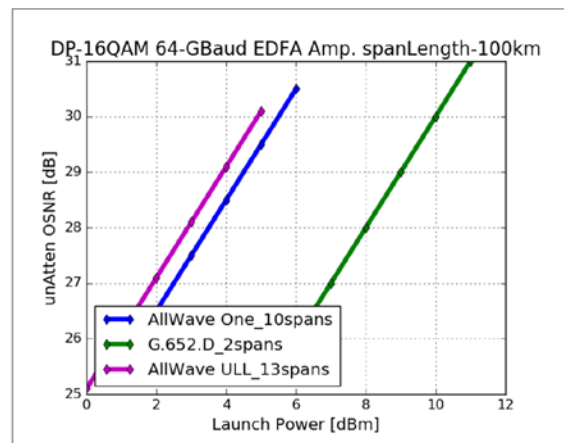
Ultra low loss fiber can provide additional optical margin beyond G.652.D fibers, enabling longer amplifier span lengths, increased site distances, ultimately decreasing overall network cost while improving performance.

This fiber supports longer un-amplified and un-regenerated reach and greater optical power margins in comparison to standard single-mode fibers and improve the performance over C- and L-band systems.

AllWave ULL supports all of the major optical amplifier types, including EDFA, Raman, and hybrid amplification to help system designers and service providers.

Following is an example comparison of number of spans possible with a given fiber type, assumptions: BER FEC Limit : 1.0e-3 , Modulation format : PM-16QAM, Baud rate : 64 Gbaud, # of channels : 9, EDFA NF : 5.0 dB

Fiber Type	80 km	100 km	120 km
G.652.D	3 spans	2 spans	1 spans
AllWave One	11 spans	10 spans	7 spans
AllWave ULL	13 spans	13 spans	9 spans



Since ultra high speed fiber network requirements are complex, contact OFS (1-888-fiberhelp) for a more detailed review of the fiber choices available for your network.

For additional information please contact your sales representative.

You can also visit our website at [www.ofsoptics.com](http://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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## Applications

AllWave® ULL Single-Mode Optical Fiber provides outstanding cable performance and design freedom for terrestrial long haul systems.

Product Specifications	AllWave ULL Optical Fiber
<b>Physical Characteristics</b>	
Clad Diameter	125.0 ± 0.7 μm
Clad Non-Circularity	≤ 0.7 %
Core/Clad Concentricity Error (Offset)	≤ 0.5 μm
Coating Diameter (Natural)	235 - 250 μm
Coating-Clad Concentricity Error (Offset)	≤ 12 μm
<b>Miscellaneous</b>	
Coating strip force to mechanically strip the dual coating	1.3N ≤ peak CSF ≤ 8.9N
Minimum stress during proof test	0.7 GPa
Dynamic tensile strength, unaged fibers, 0.5 m gauge length, 50% of samples	≥ 3.8 GPa (550 kpsi)
Dynamic fatigue parameter (nd)	≥ 20
<b>Attenuation</b>	
@ 1310 nm	≤ 0.31 dB/km
@ 1550 nm	≤ 0.17 dB/km
@ 1625 nm	≤ 0.20 dB/km
in 1285 – 1330 nm	≤ (Attenuation at 1310 nm + 0.03 dB/km)
in 1525 – 1575 nm	≤ (Attenuation at 1550 nm + 0.02 dB/km)
Local OTDR-discontinuity @ 1310 nm & 1550 nm	≤ 0.05 dB
<b>Macrobending - additional induced attenuation</b>	
32 mm dia. / 1 turn / @ 1550 nm	≤ 0.1 dB
50 mm dia. / 100 turns / @ 1310 nm	≤ 0.05 dB
50 mm dia. / 100 turns / @ 1550 nm	≤ 0.05 dB
60 mm dia. / 100 turns / @ 1550 nm & 1625 nm	≤ 0.05 dB
<b>Other Optical Properties</b>	
Zero dispersion wavelength – (λ <sub>0</sub> )	1300 nm to 1324 nm
Dispersion slope (S <sub>0</sub> ) @ λ <sub>0</sub>	≤ 0.092 ps/(nm <sup>2</sup> ·km)
Chromatic dispersion at 1550 nm	≤ 18 ps/(nm·km)
<b>Mode field diameter</b>	
@ 1310 nm	9.2 ± 0.5 μm
@ 1550 nm	10.5 ± 0.5 μm
Cut-off wavelength λ <sub>cc</sub> - cable	≤ 1260 nm
Fiber Polarization Mode Dispersion, measured in Low Mode Coupling Condition (LMC)	Individual Value: ≤ 0.1 ps/√km
- complying with IEC 60794-3, Method 1, September 2001 (N=20, Q=0.015)	Link Design Value:
Details are described in IEC/TR 61282-3 Ed.2, October 2006.	≤ 0.04 ps/√km
<b>Environmental Properties</b>	
Change in attenuation as a result of temperature variation @ 1310 nm, 1550 nm & 1625 nm (-60°C to +85°C).	≤ 0.05 dB/km
Change in attenuation as a result of temperature-humidity cycling @ 1310 nm, 1550 nm & 1625 nm (-10°C to +85°C, 95% RH).	≤ 0.05 dB/km
Change in attenuation as a result of water immersion @ 1310 nm, 1550 nm & 1625 nm (+23 ± 2°C, 30 days).	≤ 0.05 dB/km
Change in attenuation as a result of heat aging @ 1310 nm, 1550 nm & 1625 nm (+85 ± 2°C, 30 days).	≤ 0.05 dB/km