Draka

Single-Mode Fiber

TeraLight™ Optical Fiber

To minimize your chromatic dispersion compensation CAPEX

Issue date: 08/10
Supersedes: 09/09

Draka's TeraLight™ Non-Zero Dispersion Shifted Fiber (NZDSF) has set the standard for high bit-rate, multi-wavelength transmission. Its unique optimization of effective area, chromatic dispersion and dispersion slope enables excellent distorsion management cost effective operation at 10 and 40 Gbps, tight channel spacing in C- and L-bands, compatibility with the future S-band.

TeraLight™ is optimized for metropolitan backbone and long-haul applications. Its typical chromatic dispersion of 8 ps/nm.km at 1550 nm is optimized to be half that of standard single-mode fiber. It supports 10 Gbps transmission without dispersion compensation for distances of about 200 km, resulting in cost savings compared to standard single-mode fiber. For long-haul applications it results in lower costs for dispersion compensation, while still minimizing cross-channel non-linearities. For 40 Gbps operation, commercially available devices can be used.

The fiber complies with or exceeds the ITU-T Recommendations G.655.E/G.656, the IEC International Standard 60793-2-50 type B4/B5 and can be used in all cable constructions, including loose tube, tight buffered, ribbon and central tube designs. Draka's Advanced Plasma and Vapor Deposition (APVD™) manufacturing process and proprietary ColorLock-XS coating process further enhance fiber purity, reliability, and durability.

Features	Advantages
Optimized for 2.5 and 10 Gbps operation without dispersion compensation in Metropolitan area networks	• Cost savings compared to standard single-mode fiber (DCU + potentially EDFA) • Simplifies network design and management • Increase network flexibility • Allows use of cheap transmitter
40 Gbps operation with commercially available dispersion compensation devices	• Future safe investment • Close to 100% dispersion slope compensation • Contact Draka for availability
Compatibility with long haul NZDSF	• Easy extension of route distances • Consistent fiber type minimizes network complexity
More than 160 channels in C-band alone at 10 Gbps	Maximizing C-band utilization defers costly L-band deployment, providing significant cost savings
320 channels in C-, L- and S-bands at 10 Gbps	Higher capacity and more efficient bandwidth use
S-band compatibility	• Future capacity increase • Efficiently supports 1460 – 1625 nm 8 channels CWDM cheap transmission systems

Key Industry Leading Milestones

1999	2002	2003	2005
Introduced TeraLight™	World record: 6.4 Tbps over 2100 km	World record: 6000 km 80 channels at 10 Gbps	World record: 4000 km 40 channels at 40 Gbps (EDFA only)

VALUE INNOVATION

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Product Type: G.655.E, G.656
Coating Type: ColorLock-XS and Natural

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Optical Specifications

Attenuation

Attenuation at 1310 nm	≤ 0.40 dB/km
Attenuation at 1383 nm*	≤ 1.0 dB/km
Attenuation at 1550 nm	≤ 0.25 dB/km
Attenuation at 1625 nm	≤ 0.28 dB/km

** Including H2-aging according to IEC 60793-2-50, type B.1.3*

Other values available on request

Attenuation vs. Wavelength

Maximum attenuation change over the window from reference

Wavelength range (nm)	Reference λ (nm)	(dB/km)
1525 - 1575	1550	≤ 0.03
1550 - 1625	1550	≤ 0.05
1285 - 1330	1310	≤ 0.05

Point discontinuities

No point discontinuity greater than 0.05 dB at 1310 nm and 1550 nm.

Attenuation with Bending

Number of Turns	Mandrel Radius (mm)	Wavelength (nm)	Induced Attenuation (dB)
1	16	1550	≤ 0.5
100	25	1310	≤ 0.05
100	25	1550	≤ 0.05
100	30	1625	≤ 0.05

Cutoff Wavelength

Cable Cutoff wavelength (λccf)	≤ 1300 nm

Mode Field Diameter

Wavelength (nm)	MFD (µm)
1550	9.2 ± 0.5

Chromatic Dispersion

Wavelength (nm)	Chromatic Dispersion (ps/[nm.km])
1440	> 0.1
1530 – 1565	5.5 to 10
1565 – 1625	7.5 to 13.4
1285 – 1330	-10.0 to -3.0
Zero Dispersion Wavelength (λ_0):	≤ 1440 nm

Polarization Mode Dispersion (PMD)

PMD Link Design Value** (ps√km)	≤ 0.06
Max. Individual Fiber (ps√km)	≤ 0.20

*** According to IEC 60794 –3, Ed 3 (Q=0.01%)*

Geometrical Specifications

Glass Geometry

Cladding Diameter	125.0 ± 1.0 µm
Core/Cladding Concentricity Error	≤ 0.6 µm
Cladding Non-Circularity	≤ 1.0 %
Fiber Curl (Radius)	≥ 4 m

Coating Geometry

Coating Diameter	242 ± 7 µm
Coating/Cladding Concentricity Error	≤ 12 µm
Coating Non-Circularity	≤ 5 %
Length	Standard lengths up to 25.2 km

Mechanical Specifications

Proof Test

The entire length is subjected to a tensile proof stress ≥ 0.7 GPa (100 kpsi); 1% strain equivalent

Tensile Strength

Dynamic tensile strength (0.5 meter gauge length):

Aged*** and unaged:	median > 3.8 GPa (550 kpsi)

**** Aging at 85°C, 85% RH, 30 days*

Dynamic and Static Fatigue

Dynamic fatigue, unaged and aged***	$n_d \geq 20$
Static fatigue, aged***	$n_s \geq 23$

Coating Performance

Coating strip force unaged and aged****:

- Average strip force:	1 N to 3 N
- Peak strip force:	1.2 N to 8.9 N

***** Aging:*

- *0°C and 45°C*
- *30 days at 85°C and 85% RH*
- *14 days water immersion at 23°C*
- *Wasp spray exposure (Telcordia)*

Environmental Specifications

Attenuation

Environmental Test	Test Conditions	Induced Attenuation at 1310, 1550 nm (dB/km)
Temperature cycling	- 60°C to 85°C	≤ 0.05
Temperature-Humidity cycling	- 10°C to 85°C, 4-98% RH	≤ 0.05
Water Immersion	14 days; 23°C	≤ 0.05
Dry Heat	30 days; 85°C	≤ 0.05
Damp Heat	30 days; 85°C; 85% RH	≤ 0.05

Typical Values

Miscellaneous

Dispersion at 1310 nm	- 6 ps/(nm.km)
Dispersion at 1550 nm	8 ps/(nm.km)
Dispersion at 1625 nm	12 ps/(nm.km)
Dispersion slope at 1550 nm	0.052 ps/(nm^2.km)
Effective area	63 µm^2
Effective group index @ 1310 nm	1.4682
Effective group index @ 1550 nm	1.4683
Effective group index @ 1625 nm	1.4685
Rayleigh Backscatter Coefficient for 1 ns pulse width:	
@ 1310 nm	- 77.4 dB
@ 1550 nm	- 80.4 dB
@ 1625 nm	- 81.3 dB

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