Draka

Single-Mode Fiber

Single-Mode Optical Fiber (SMF)

First class reliability thanks to Draka proprietary processes and coating system

Issue date: 08/10
Supersedes: 05/09

Draka Single-Mode Fiber (SMF) provides optimum performance in both the 1310 nm and 1550 nm wavelength operation ranges (including the 1565 – 1625 nm L-band), with a low dispersion in the 1310 nm window. It can be used in all cable constructions, including loose tube, tight buffered, ribbon, and central tube designs. It supports long haul, metropolitan, access and premises applications in telecommunications, CATV, utility and intelligent traffic networks.

Draka fibers are further enhanced with the proprietary ColorLock™ coating process. This process enables optimum fiber performance, reliability and durability, even in the harshest environments. Draka Advanced Plasma and Vapor Deposition (APVD™) manufacturing process ensures the highest quality and purity of fibers.

The fiber complies with or exceeds the ITU-T Recommendation G.652.B, the IEC International Standard 60793-2-50 type B.1.1 Optical Fiber Specification, Telcordia GR-20-CORE, ANSI/ICEA S-87-640 and RUS 7CFR 1755.900.

Features	Advantages
Low attenuation and dispersion; highly efficiënt for O-band (1260 – 1360 nm), C- and L-band (1530 – 1625 nm)	Support all applications
Fully compatible with other fibers in terms of transmission, connections and installation tools	Open standards for multiple-sourcing worldwide
Easy to strip, using both mechanical and heat- stripping techniques	Easier, faster and more secure connections
Proprietary APVD™ manufacturing process	Superior geometry, uniformity and purity
Revolutionary ColorLock-XS coating process	• Increased reliability, durability, and superior aging performance, resulting in lower maintenance and replacement costs. • Makes color a component of the coating, thus enhancing fiber identification and colored fiber reliability. • Consistent, vibrant color for easy-of-use and flexibility

Key Industry Leading Milestones

1998	2002	2008
ColorLock™: world only life time guaranteed colored fibers	BendBright SMF with macro-bending improved performances	ColorLock-XS: extreme protection against micro-bendings

VALUE INNOVATION

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Product Type: G.652.B
Coating Type: ColorLock-XS and Natural

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Optical Specifications

Attenuation

Attenuation at 1310 nm	0.33 – 0.35 dB/km
Attenuation at 1383 nm	1 dB/km
Attenuation at 1550 nm	0.19 – 0.22 dB/km
Attenuation at 1625 nm	0.21 – 0.24 dB/km

Other values available on request

Attenuation vs. Wavelength

Maximum attenuation change over the window from reference

Wavelength range (nm)	Reference λ (nm)	(dB/km)
1285 – 1330	1310	≤ 0.03
1525 - 1575	1550	≤ 0.02
1550 - 1625	1550	≤ 0.03

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)
100	25	1310	≤ 0.05
100	25	1550	≤ 0.05
100	30	1625	≤ 0.05

Cutoff Wavelength

Cable Cutoff wavelength (λccf)	≤ 1260 nm

Mode Field Diameter

Wavelength (nm)	MFD (µm)
1310	9.0 ± 0.4
1550	10.1 ± 0.5

Chromatic Dispersion

Wavelength (nm)	Chromatic Dispersion (ps/[nm.km])
1285 – 1330	≤ |3|
1550	≤ 18.0
1625	≤ 22.0
Zero Dispersion Wavelength (λ_0):	1300 - 1322 nm
Slope (S_0) at λ_0:	≤ 0.090 ps/(nm^2.km)

Polarization Mode Dispersion (PMD)

PMD Link Design Value* (ps√km)	≤ 0.08
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 50.4 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

Nominal Zero Dispersion Slope	0.085 ps/(nm^2.km)
Effective group index @ 1310 nm	1.467
Effective group index @ 1550 nm	1.468
Effective group index @ 1625 nm	1.468
Rayleigh Backscatter Coefficient for 1 ns pulse width:	
@ 1310 nm	- 79.4 dB
@ 1550 nm	- 81.7 dB
@ 1625 nm	- 82.5 dB
Median Dynamic Tensile Strength	5.3 GPa (750 kpsi)

(Aged at 85°C, 85% RH, 30 days; 0,5 m gauge length)

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