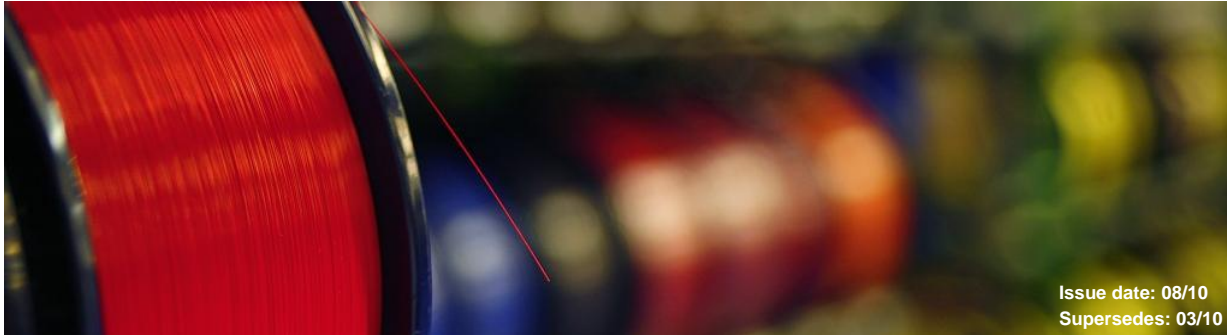




Single-Mode Fiber

BendBright-XS 200 μ m Single-Mode Optical Fiber

Truly bend-insensitive SMF, for compact cables and small connectivities foot print



Issue date: 08/10
Supersedes: 03/10

Draka BendBright-XS 200um allows cable designers to drastically reduce cable diameters for most OSP cable designs. This feature not only increases fiber density in ducts, it reduces size & weight of aerial cables and it allows designers to increase fiber density in OPGW.

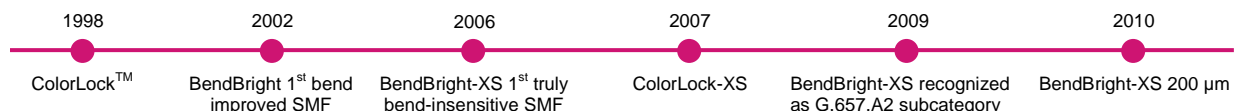
Draka BendBright-XS fiber combines attractive features: excellent low macro-bending sensitivity, low water peak level and G.657.A2 + G.652.D compliance. Together they allow unlimited use of the whole telecom wavelength window (1260nm to 1650nm) for a great variety of applications. BendBright-XS 200 μ m offers in addition a reduced outside diameter for drastic reduction of cables and fiber management systems footprints and weight. It can dramatically reduce the total cost of ownership of a networks while limiting the environmental impact of its deployment. Reduction of civil works, possibility to reuse existing ducts, lower costs of pathways fees are immediate benefits.

BendBright-XS 200 μ m is similar in its optical and glass parts to the standard BendBright-XS. Size reduction has been obtained by reducing the coating diameter. Thanks to the quality of modern coatings no compromise had to be made to the overall quality of the fiber and to its performances. Notably Draka has carried exhaustive tests that proved its compatibility with the most popular installation tools and backward compatibility with legacy fibers.

BendBright-XS 200 μ m fully complies with or exceeds the ITU-T Recommendations G.657.A1, G.657.A2, G.657.B2 (2009) and G.652.D (2009). It satisfies all IEC testing requirements for dimensional, transmission, mechanical and environmental performances, except for a slightly reduced coating strip force. BendBright-XS 200 μ m has been demonstrated to be fully appropriate for cable manufacturing and field installation.

Features	Advantages
Reduced coating diameter (200 μ m)	<ul style="list-style-type: none"> • Reduction of cable diameter • Reduction of fiber management systems footprint • Reduction of the total cost of ownership and of the environmental impact of network deployments
Same glass diameter than conventional fiber (125 μ m) and similar mode field diameter	<ul style="list-style-type: none"> • Compatible with standard cleaving and stripping tools • Can be spliced with similar settings of the fusion splice program as applied for other G.652 fibers • Low loss splicing of BendBright-XS to other G.652 fibers
Full compliance with G.652.D and truly bend- insensitive up to the highest wavelength	<ul style="list-style-type: none"> • All bands utilization, from O- to L-Band • Future systems evolutions proof (10G-PON, WDM-PON and beyond)

Key Industry Leading Milestones



BendBright-XS 200 μm Single-Mode Optical Fiber

Truly bend-insensitive SMF, for compact cables and small connectivities foot print

Product Type: G.657.A1, G.657.A2, G.657.B2, G.652.D
Coating Type: ColorLock-XS

Issue date: 08/10
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Optical Specifications

Attenuation	
Attenuation at 1310 nm	0.33 – 0.35 dB/km
Attenuation at 1383 nm*	0.32 – 0.35 dB/km
Attenuation at 1460 nm	0.25 dB/km
Attenuation at 1550 nm	0.19 – 0.20 dB/km
Attenuation at 1625 nm	0.20 – 0.21 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)
1285 – 1330	1310	≤ 0.03
1525 - 1575	1550	≤ 0.02
1460 - 1625	1550	≤ 0.04

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)
10	15	1550	≤ 0.03
10	15	1625	≤ 0.1
1	10	1550	≤ 0.1
1	10	1625	≤ 0.2
1	7.5	1550	≤ 0.5
1	7.5	1625	≤ 1.0

Cutoff Wavelength

Cable Cutoff wavelength (Accf) ≤ 1260 nm

Mode Field Diameter

Wavelength (nm)	MFD (μm)
1310	8.8 ± 0.4
1550	9.8 ± 0.5

Chromatic Dispersion

Wavelength (nm)	Chromatic Dispersion (ps/[nm.km])
Zero Dispersion Wavelength (λ_0):	1300 - 1324 nm
Slope (S_0) at λ_0 :	≤ 0.092 ps/(nm ² .km)

Polarization Mode Dispersion (PMD)

PMD Link Design Value** (ps $\sqrt{\text{km}}$)	≤ 0.06
Max. Individual Fiber (ps $\sqrt{\text{km}}$)	≤ 0.1

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

Geometrical Specifications

Glass Geometry

Cladding Diameter	125.0 ± 0.7 μm
Core/Cladding Concentricity Error	≤ 0.5 μm
Cladding Non-Circularity	≤ 0.7 %
Fiber Curl (Radius)	≥ 4 m

Coating Geometry

Coating Diameter	200 ± 10 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: 0.8 N to 3 N

- Peak strip force: 1.0 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	0.088 ps/(nm ² .km)
Effective group index @ 1310 nm	1.467
Effective group index @ 1550 nm	1.467
Effective group index @ 1625 nm	1.468

Rayleigh Backscatter Coefficient for 1 ns pulse width:

@ 1310 nm	- 79.1 dB
@ 1550 nm	- 81.4 dB
@ 1625 nm	- 82.2 dB

Median Dynamic Tensile Strength 5.3 GPa (750 kpsi)

(Aged at 85°C, 85% RH, 30 days; 0.5 m gauge length)