

Bend-Insensitive 10, 40, 100 Gb/s Multimode Fibre (OMx = OM2 / OM2+ / OM3 / OM4)



Issue date: 09/12
Supersedes: 04/12

850 nm Laser-Optimized 50 µm Bend-Insensitive Multimode Fiber for 10 Gb/s applications

Draka 850 nm laser-optimized 50 µm bend-insensitive multimode fiber (MaxCap-BB-OMx) has been designed in robust quality classes OM2, OM2+, OM3 and OM4 fiber. The outstanding bending performance of this fiber combines improved fiber and cable management with superior bandwidth (low DMD) for 10, 40 and 100 Gb/s system applications. The eminent bending performance of MaxCap-BB-OMx fibers is based on the large know-how built up developing Draka world-acclaimed Bend-Insensitive single-mode fibers BendBright-XS and BendBright-Elite. This BendBright technology is referred to in the title of this product by the abbreviation BB.

MaxCap-BB-OM2 / OM2+ / OM3 / OM4 fibers support compact cable management and allow more easily MACs (Moves, Adds, Changes) applied in Local Area Networks (LAN) backbones up to 550 m (10GBASE-SX) and in Data Centers up to 150 m at 40G/100G bitrates (40GBASE-SR4 and 100GBASE-SR10). The MaxCap-BB-OMx multimode fibers are produced by the proprietary Plasma-activated Chemical Vapor Deposition process (PCVD), acknowledged worldwide as offering the best core profile accuracy for multimode fibers.

Application in other LAN systems

The MaxCap-BB-OM3 / OM4 multimode fibers types entirely comply with or exceed IEC 60793-2-10 type A1a.2 / A1a.3 Optical Fiber Specification, ISO/IEC 11801 OM3 / OM4 specification, TIA/EIA-492AAAC / 492AAD detail specification and Telcordia GR-20-CORE and GR-409-CORE specifications.

Features	Advantages
MaxCap-BB-OM2 / OM2+ / OM3 / OM4 high bandwidth capability is combined with extremely low bending sensitivity	Margins in 10 Gb/s (and beyond) systems, supported by high bandwidth OM2 / OM2+ / OM3 / OM4 are further improved by additional low bending loss, offering more relaxed and easier installations and MACs (Moves, Adds, Changes)
MaxCap-BB-OM2 / OM2+ / OM3 / OM4 low bending sensitivity	Allows use of smaller, high density fiber management systems, as key issue in limited space data centers, computer rooms and LANs. Overall system network reliability (uptime) is improved thanks to the reduction of system impairments due to tight bends introduced by humane mistakes
MaxCap-BB-OM2+ / OM3 / OM4 fulfill both EMB and DMD requirements; also a tighter inner-DMD mask (0 – 18 µm) is used	Compared to the standards (and competitors) Draka's MaxCap-BB-OMx fibers ultimately offer additional robustness in 10Gb/s and beyond systems
Coated with the dual layer UV Acrylate	MaxCap-BB-OMx multimode fibers show excellent micro-bending behavior, which results in easy cabling and installation, supporting a maximum cabled attenuation of 3.0 dB/km at 850 nm

Key Industry Leading Milestones



Bend-Insensitive 10, 40, 100 Gb/s Multimode Fibre (OMx = OM2 / OM2+ / OM3 / OM4)

Product Type: MaxCap-BB-OMx Multimode Fibre
Coating Type: Dual Layer Primary Coating (DLPC9)

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Characteristics	Conditions	Specified Values				Units
Optical Specifications (Uncabled fibre)						
Attenuation Coefficient	850 nm	≤ 2.3		≤ 2.4		dB/km
	1300 nm	≤ 0.5		≤ 0.6		
Numerical Aperture		0.200 ± 0.015				
Chromatic Dispersion						
Zero Dispersion Wavelength, λ_0		$1295 \leq \lambda_0 \leq 1340$				nm
Zero Dispersion Slope, S_0	$1295 \text{ nm} \leq \lambda_0 \leq 1310 \text{ nm}$	≤ 0.105				ps/nm ² .km
	$1310 \text{ nm} \leq \lambda_0 \leq 1340 \text{ nm}$	$\leq 0.000375 (1590 - \lambda_0)$				
Fibre Capacity	40GBASE-SR4 / 100GBASE-SR10	MaxCap-BB-OM2	MaxCap-BB-OM2+	MaxCap-BB-OM3	MaxCap-BB-OM4	m
	10GBASE-SR	≤ 83	≤ 150	≤ 300	$\leq 550^1$	m
	1GBASE-SR	≤ 600	≤ 750	≤ 1000	≤ 1100	m
Overfilled Modal Bandwidth	850 nm	≥ 500	≥ 700	≥ 1500	≥ 3500	MHz.km
	1300 nm	≥ 500	≥ 500	≥ 500	≥ 500	MHz.km
Effective Modal Bandwidth	850 nm	-	≥ 950	≥ 2000	≥ 4700	
DMD		See note 2				
Bending Loss	2 turns, Radius=7.5 mm; 850nm / 1300nm	≤ 0.2		≤ 0.5		dB
	2 turns, Radius=15 mm; 850nm / 1300nm	≤ 0.1		≤ 0.3		
Backscatter Characteristics³						
Point Discontinuity ⁴	850 nm, 1300 nm	≤ 0.1				dB
Irregularities over fibre length	850 nm, 1300 nm	≤ 0.1				dB
Reflections		Not allowed				
Group Index of Refraction (Typ.)	850 nm	1.482				
	1300 nm	1.477				
Geometrical Specifications						
Core Diameter		50 ± 2.5				μm
Core Non-Circularity		≤ 5				%
Core/Cladding Concentricity Error		≤ 1				μm
Cladding Diameter		125.0 ± 1.0				μm
Cladding Non-Circularity		≤ 0.7				%
Coating Diameter		242 ± 5				μm
Coating Non-Circularity		≤ 5				%
Coating/Cladding Concentricity Error		≤ 6				μm
Length	Standard lengths up to Other lengths available on request	8.8				km
Mechanical Specifications						
Proof Test	Off line	$> 0.7 (100)$				GPa (kpsi)
Dynamic Tensile Strength (median value)	0.5 meter gauge length unaged and aged ⁵	$> 3.8 (550)$				GPa (kpsi)
Fatigue Parameter (Typical)	Dynamic fatigue, unaged and aged ⁵	$n_d > 25$				
Coating Strip Force	Average strip force, unaged and aged ⁶	1 to 3				N
	Peak strip force, unaged and aged ⁶	1.3 to 8.9				N
Environmental Specifications						
Temperature Cycling	850 nm, 1300 nm; -60°C to +85°C	≤ 0.1				dB/km
Temperature-Humidity Cycling	850 nm, 1300 nm; -10°C to +85°C, 4-98% RH	≤ 0.1				dB/km
Water Immersion	850 nm, 1300 nm; 23°C, 30 days	≤ 0.1				dB/km
Dry Heat	850 nm, 1300 nm; 85°C, 30 days	≤ 0.1				dB/km
Damp Heat	850 nm, 1300 nm; 85°C; 85% RH, 30 days	≤ 0.1				dB/km

- 1). Maximum cabled fiber attenuation 3.0 dB/km at 850 nm, maximum total connector loss of 1.0 dB and VCSELs maximum RMS spectral width of 0.29 nm (according to IEEE 10GbE model: http://grouper.ieee.org/groups/802/3/ae/public/adhoc/serial_pmd/documents/10GEPBud3_1_16a.xls).
- 2). DMD specifications are compliant with and more stringent than the requirements of IEC 60793-2-10 (type A1a.2 for OM3 and type A1a.3 for OM4), TIA-492AAAC (OM3) and 492AAAD (OM4).
- 3). OTDR measurement with 0.5 μs pulse width.
- 4). Mean of bi-directional measurement.
- 5). Aging at 85 °C, 85% RH, 30 days.
- 6). Aging at 23 °C, 0 °C and 45 °C; 30 days at 85 °C and 85% RH; 14 days water immersion at 23 °C.