Draka

Multimode Fiber

MaxCap-BB-OMx – Bend-Insensitive Multimode Optical Fiber
OMx = OM2 / OM2$^+$ / OM3 / OM4

Issue date: 06/11
Supersedes: 07/10

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

Draka has designed a robust 850 nm laser-optimized 50 µm bend-insensitive multimode fiber: MaxCap-BB in quality classes OM2, OM2$^+$, OM3 and OM4 fiber. The outstanding bending performance of this fiber combines improved fiber and cable management with high bandwidth for 10G – 40G – 100G system applications. The eminent bending performance of MaxCap-BB-OMx fibers is based on the large know-how Draka built up developing its world-acclaimed Bend-Insensitive single-mode fibers BendBright-XS and BendBright-Elite, added on top of successful MaxCap multimode fibers for premium bandwidth.

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 / 492AAAD 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	10 G (and up) system margins, 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, Draka's MaxCap-BB-OM2$^+$ / OM3 / OM4 fibers ultimately offer additional robustness in 10Gb/s systems
Coated with the dual layer UV Acrylate DLPC9	MaxCap-BB-OM2 / OM2$^+$ / OM3 / OM4 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

1999	2003	2006	2010
First shipments of what in 2002 became OM3 fiber	First OM3 type fiber with 10 Gb/s extended reach over 550 m: MaxCap-OM4 fiber	First Bend-Insensitive single-mode fiber: BendBright-XS	Introduction of Bend-Insensitive OM2 / OM2$^+$ / OM3 / OM4 fiber: MaxCap-BB-OMx

VALUE INNOVATION

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MaxCap-BB-OMx – Bend-Insensitive Multimode Optical Fiber
OMx = OM2 / OM2$^+$ / OM3 / OM4

Product Type: 50 / 125 / 242 µm Bend-Insensitive Multimode Fiber **Issue date: 06/11**
Coating Type: Dual Layer Primary Coating (DLPC9) **Supersedes: 07/10**

Characteristics	Conditions	Specified Values				Units
Optical Specifications (Uncabled fiber)						
Attenuation Coefficient	850 nm	≤ 2.1	≤ 2.2		≤ 2.3	dB/km
	1300 nm	≤ 0.4	≤ 0.5		≤ 0.6	dB/km
Numerical Aperture		0.200 ± 0.015				
Chromatic Dispersion						
Zero Dispersion Wavelength, λ_0		1295 ≤ λ_0 ≤ 1340				nm
Zero Dispersion Slope, S_0	1295 nm ≤ λ_0 ≤ 1310 nm	≤ 0.105				ps/nm^2.km
	1310 nm ≤ λ_0 ≤ 1340 nm	≤ 0.000375 (1590 - λ_0)				ps/nm^2.km
		MaxCap-BB-OM2	**MaxCap-BB-OM2$^+$**	**MaxCap-BB-OM3**	**MaxCap-BB-OM4**	
Fiber Capacity[2]	850 nm; 10GBASE-SX	≤ 83	≤ 150	≤ 300	≤ 550	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	MHz.km
DMD		See note 1				
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				dB
Backscatter Characteristics[3]						
Point Discontinuity[4]	850 nm, 1300 nm	≤ 0.1				dB
Irregularities over fiber 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				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	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). 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).
2). 10 Gb/s distance of 550 meters is offered using a maximum cabled fiber attenuation of 3.0 dB/km at 850 nm, a maximum total connector loss of 1.0 dB and VCSELs using a maximum RMS spectral width of 0.29 nm (according to the IEEE 10GbE model: http://grouper.ieee.org/groups/802/3/ae/public/adhoc/serial_pmd/documents/10GEPBud3_1_16a.xls).
3). OTDR measurement using a 0.5 µs pulse-width.
4). Average Bidirectional average 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

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