

tML[®] - FO patch cord both sides 1x MPO/MTP[®] Female 12G50/125 μ OM4 LSOH, Type B, Length: xxx



tML[®] Xtended

tML[®] Xtended is a patented, modular cabling system consisting of the three key components module, trunk cable and rack mount enclosure. The system components are 100 percent manufactured, pre-assembled and tested in Germany. They enable plug-and-play installation on site – especially in data centres, but also in industrial environments – within the shortest possible time. Heart of the system are the rear MPO/MTP[®] 12 fiber and Telco connectors, which can be used to connect at least six or twelve ports at a time. Depending on the module configuration, transfer rates of up to 200G are currently possible with SR4. The fibre optic and TP modules can be used together in a module carrier with a very high port density. The tde offers its tML[®] cabling system as a proven tML[®] standard system and in the highly innovative variants tML[®] 24 system and now tML[®] 32 system for extreme scalability and very easy migration to higher transmission rates such as 40G, 100G, 200G and 400G.



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Technical Data

The tML[®]- FO patch cord is preterminated with MPO/MTP[®]connectors on both ends. The Cable is very slim and flexible. The end faces of the connectors are optimized by means of Lasercleaving and machine polish. The MPO/MTP[®]plug has a defined fiber height of 1 - 3.5 μ . The max. adjacent fiber height difference is 0.2 μ m and for all fibers 0.3 μ m. All system components (modules, trunk cables and patch cords) are co-ordinated for the reaching of the performance particularly. The module is marked with sequential serial number and article number.

Cable	Round cable, 3 mm, loose tube, LSOH, magenta
Option	unsensitive ClearCurve [®] Corning fiber
Connectors	MPO/MTP [®] Female Push Pull (magenta)
Pin out	Type B
Tests	Interferometer, Insertion Loss, Return Loss and Visual Final Inspection; all measured values are electronically archived
	QS-Managementsystem ISO 9001, ISO 14001 and TL 9000

xxx - stands for the cable length in meters (every length available)

FO Connectors

The end faces of the connectors are optimized by means of Lasercleaving and machine polish. The MPO/MTP[®] plug has a defined fiber height of 1 - 3.5 μ . The max. adjacent fiber height difference is 0.2 μ m and for all fibers 0.3 μ m.

Connector

Type	MPO/MTP [®] Female Push Pull Locking (Magenta)
Ferrule	12 Fiber MM Elite [®] ferrule, PPS
Boot colour	Black
Manufacturer	tde/US Conec

Optical Performance

Fiber	Type	Wavelength	Insertion loss typ.	Insertion loss max.	Return loss min.
50/125 μ OM4	MPO/MTP [®]	850 /1300 nm	≤ 0.12 dB	0.25 dB	35 dB

FO Cables

Standards	EN 50173-5
	IEC 60794-2-20
	ISO/IEC 24764
Flame resistance	IEC 60332-1-2
	IEC 60332-2-2
	IEC 60754-1

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	IEC 60754-2
	IEC 61034

Cable construction

Type	IVH12G50-OM4
Loose tube	12 coated fibers within PVC-core tube
Wall thickness PVC-tube	0.20 mm – 0.25 mm
Fiber type	MM-OM4, 50/125 μ , Corning ClearCurve OM4
Strength members	Aramid yarn
Outer jacket	LSZH (Halogen free, low smoke, flame retardant thermoplastic compound)
Jacket color	Magenta, RAL 4003
Identification	"t d e – IVH12G50-MPO-OM4 LSZH" and sequential meter marking + Lot number

Physical properties

Outer diameter cable	3.0 \pm 0.1 mm
Diameter PVC-core tube	1.8 \pm 0.1 mm
Max. tensile load	300 N
Min. bending radius	30 mm
Temperature range (storage, installation, operation)	-20°C to +70°C

FO Fiber

Type	Corning ClearCurve [®] 50/125 μ OM4 multimode fiber
Optimized Data Rate over Distance	40/100 Gb over 170 m* 10 Gb/s over 550 m 1 Gb/s over 1100 m
Standard Compliance	ISO/IEC 11801: type OM4 fiber** IEC 60793-2-10: type A1a.3 fiber** TIA/EIA: 492AAAD ITU: ITU G651.1
*	Distances specified in the 40G/100G per IEEE 802.3ba standard are 150m on OM4 and 100m on OM3; Corning fibers are manufactured to tighter dispersion specifications and thereby support the extended distances shown in the table (assuming cable attenuation \leq 3.0 dB/km and same 1.0 dB of connector loss for OM3 that the standard requires for OM4)
**	Assumes IEC draft standard is harmonized with 492AAAD which was approved by TIA

Optical Specifications

Bandwidth	High Performance EMB* (MHz.km): 4700 at 850 nm only Legacy Performance EMB** (MHz.km): 3500 at 850 nm / 500 at 1300 nm
Attenuation	At 850 nm max. \leq 2.3 dB/km At 1300 nm max. \leq 0.6 dB/km

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Macrobend Loss	Mandrel Radius (mm): 37.2 / 15 / 7.5 Number of Turns: 100 / 2 / 2 Induced Attenuation (dB) at 850 nm: $\leq 0.05 / \leq 0.1 / 0.2$ Induced Attenuation (dB) at 1300 nm: $\leq 0.15 / \leq 0.3 / \leq 0.5$
Numerical Aperture	0.200 \pm 0.015
*	Ensured via miniEMBc, per TIA/EIA 455-220A and IEC 60793-1-49, for high performance laser-based systems (up to 10Gb/s)
**	OFL BW, per TIA/EIA 455-204 and IEC 60793-1-41, for legacy and LED-based systems (typically up to 100 Mb/s)

Dimensional Specifications

Core Diameter	50.0 \pm 2.5 μ m
Cladding Diameter	125.0 \pm 1.0 μ m
Core-Clad Concentricity	$\leq 1.5 \mu$ m
Cladding Non-Circularity	$\leq 1.0\%$
Core Non-Circularity	$\leq 5.0\%$
Coating Diameter	242 \pm 5 μ m
Coating-Cladding Concentricity	$< 12 \mu$ m

Environmental

Environmental Test	Test Condition	Induced Attenuation 850 nm & 1300 nm (dB/km)
Temperature Dependence	-60°C to +85°C	≤ 0.10
Temperature Humidity Cycling	-10°C to +85°C and 4% to 98% RH	≤ 0.10
Water Immersion	23°C \pm 2°C	≤ 0.20
Heat Aging	85°C \pm 2°C	≤ 0.20
Damp Heat	85°C at 85% RH	≤ 0.20
Operating Temperature Range	-60°C to +85°C	

Mechanical Specifications

Proof Test	The entire fiber length is subjected to a tensile stress ≥ 100 kpsi (0.7 GN/m ²).
Length	Fiber lengths available up to 17.6 km/spool.

Performance Characterizations

Refractive Index Difference	1%
Effective Group Index of Refraction	850 nm: 1.480 1300 nm: 1.479
Fatigue Resistance Parameter (nd)	20
Coating Strip Force	Dry: 0.6 lbs (2.7N) Wet: 14 days in 23°C water soak: 0.6 lbs (2.7N)
Chromatic Dispersion	Zero Dispersion Wavelength (λ_0): 1295 nm $\leq \lambda_0 \leq$ 1315 nm Zero Dispersion Slope (S_0): ≤ 0.101 ps/(nm ² *km)

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Product variants & accessories

Art.-No.	Description
TML-MP/MP09I12E-Bxxx	tML [®] - FO patch cord both sides 1x MPO/MTP [®] Female 12E9/125 μ OS2 LSOH, Type B, Length: xxx
TML-MP/MP50I12G3Bxxx	tML [®] - FO patch cord both sides 1x MPO/MTP [®] Female 12G50/125 μ OM3 LSOH, Type B, Length: xxx
TML-MP/MP50I12G4Bxxx	tML [®] - FO patch cord both sides 1x MPO/MTP [®] Female 12G50/125 μ OM4 LSOH, Type B, Length: xxx
TML-MP/MP50I12G5Bxxx	tML [®] - FO patch cord both sides 1x MPO/MTP [®] Female 12G50/125 μ OM5 LSOH, Type B, Length: xxx