

tML<sup>®</sup> Xtended - FO Trunk Cable both sides 6xMPO/MTP<sup>®</sup> with Pins 72E9/125µ OS2 LSHF, Type B,  
Length: xx in m



## tML<sup>®</sup> - tde Modular Link

tML<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> cabling system as a proven tML<sup>®</sup> standard system and in the highly innovative variants tML<sup>®</sup> Xtended, tML<sup>®</sup> 24 System and now tML<sup>®</sup> 32 System for extreme scalability and very easy migration to higher transmission rates such as 40G, 100G, 200G and 400G.

The tML<sup>®</sup> Xtended - module will be installed in the link on one side rotated 180 degrees. The associated tML<sup>®</sup> Xtended trunk cable has a type B pin out. The complete link corresponds to EIA / TIA "Method B". The advantage is that before and after migration uniformly configured patch cables and modules are used.



**tde<sup>®</sup> trans data elektronik GmbH**

**Headquarter address:**

Lingener Str. 2  
D-49626 Bippen/Ohrte  
Tel.: +49 5435 9511 0  
Fax.: +49 5435 9511 32

**Sales office address:**

Prinz-Friedrich-Karl-Str. 46  
D-44135 Dortmund  
Tel.: +49 231 8805 61 13  
Fax.: +49 231 8805 61 15

info@tde.de | www.tde.de

tML® Xtended - FO Trunk Cable both sides 6xMPO/MTP® with Pins 72E9/125µ OS2 LSHF, Type B,  
Length: xx in m

## Technical Data

The tML®- FO trunk cable is preterminated with MPO/MTP® connectors on both ends. 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 - 3.5µ. The max. adjacent fiber height difference is 0.2µm and for all fibers 0.3µm. All system components (modules, trunk cables and patch cords) are co-ordinated for the reaching of the performance particularly. The fan-out unit is optimized for tML® - Cable Mounting Bracket for Fan-out Units. The module is marked with sequential serial number and article number.

## 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 - 3.5µ. The max. adjacent fiber height difference is 0.2µm and for all fibers 0.3µm.

### Connector

Type	MPO/MTP® APC Male Push Pull Locking with Elite Pins (green)
Ferrule	12 Fiber SM Elite® ferrule, PPS
Boot colour	Black
Temperature range	-40°C bis +75°C
Manufacturer	tde/US Conec

### Optical Performance

Fiber	Type	Wavelength	Insertion loss typ.	Insertion loss max.	Return loss min.
9/125µ OS2	MPO/MTP®APC	1310 / 1550 nm	≤ 0.10 dB	0.20 dB	75 dB

## FO Fan-Out

Ø Single unit	3.0 mm
Single unit length	78 ± 5 cm (not stepped)

## FO Cables

### Mechanical characteristics

Temperature range	Storage -25 to +70°C, IEC 60794-1-22 F1
	Pulling in -10 to +50°C
	Operation -25 to +60°C
Tensile performance	IEC 60794-1-21 E1
Crush resistance	IEC 60794-1-21 E3
Impact	IEC 60794-1-21 E4
Repeated bending	IEC 60794-1-21 E6
Torsion	IEC 60794-1-21 E7

tML® Xtended - FO Trunk Cable both sides 6xMPO/MTP® with Pins 72E9/125µ OS2 LSHF, Type B,

Length: xx in m

Bend	IEC 60794-1-21 E11
Water penetration	IEC 60794-1-22 F5

## General characteristics

Sheath colour	green, similar to RAL 6016
Zero halogen, no corrosive gases	IEC 60754-1/-2, EN 60754-1/-2, VDE 0482-754-1/-2
Flame propagation	IEC 60332-1-2, EN 60332-1-2, VDE 0482-332-1-2
Flame spread	IEC 60332-3-24, EN 50266-2-4, VDE 0482-266-2-4
Minimum smoke emission	IEC 61034-1/-2, EN 61034-1/-2 (EN 50268-1/-2), VDE 0482-1034-1/-2 (VDE 0482-268-1/-2)
Smoke density	EN 13501-6: E <sub>ca</sub>

Cabletype	Universal U-DQ(ZN)BH for indoor and outdoor use
	non metallic, dry interstices, rodent protection, flame retardant, in accordance with IEC 60332.1 and IEC 60332.3 C
Fibertype	Corning E9/125 G.652.D
No. of fibers	72
Loose tube	6
Sheath ø	12.2 mm
Weight	164 kg/km
Bending radius	185 mm
Tensile load	6000 N
Crush resistance	3000 N continuous
	5000 N short term
Fire load	681 kWh/km
	2218 MJ/km

## Length tolerances (prefabricated with plugs)

Tolerances for lengths up to 40m	± 100 cm
Tolerances for lengths up to 100m	± 100 cm
Tolerances for lengths from 100m	± 2%

## FO Fiber

### Optical properties

Maximum attenuation (cabled)	1310 nm: 0.34 / 1383 nm: 0.34* dB/km (*post hydrogen aging performance)
Maximum Chromatic Dispersion	3.5 ps/(nm x km)
Zero Dispersion Wavelength λ <sub>0</sub>	1304 ≤ λ <sub>0</sub> ≤ 1324 nm
Maximim Zero Dispersion Slope S <sub>0</sub>	0.092 ps/(nm <sup>2</sup> x km)
Mode-Filed Diameter	9.2 +/- 0,4 µm

tML<sup>®</sup> Xtended - FO Trunk Cable both sides 6xMPO/MTP<sup>®</sup> with Pins 72E9/125 $\mu$  OS2 LSHF, Type B,

Length: xx in m

Maximum Cable Cut-off Wavelength $\lambda_{CC}$	1260 nm
PDM Link Design Value	$\leq 0.04$ ps/ $\sqrt{\text{km}}$
Max. individual fibre PMD	$\leq 0.1$ ps/ $\sqrt{\text{km}}$
Max. individual cable PMD	$\leq 0.2$ ps/ $\sqrt{\text{km}}$
Refractive Index	1.4676

## Mechanical properties

Cladding diameter	125.0 +/- 1.0 $\mu\text{m}$
Maximum Core/Cladding Concentricity Error	0.5 $\mu\text{m}$
Maximum Cladding Non-Circularity	0.7 %
Coating diameter	245 +/- 5 $\mu\text{m}$
Maximum Cladding/Coating Concentricity Error	12 $\mu\text{m}$
Operating temperature range	-60 to +85°C
Test load	100 kpsi

## Product variants & accessories

Art.-No.	Description
TML-MPP/MPP09B12E-Bxx	tML <sup>®</sup> Xtended - FO Trunk Cable both sides 1xMPO/MTP <sup>®</sup> with Pins 12E9/125 $\mu$ OS2 LSHF, Type B, Length: xx in m
TML-MPP/MPP09B24E-Bxx	tML <sup>®</sup> Xtended - FO Trunk Cable both sides 2xMPO/MTP <sup>®</sup> with Pins 24E9/125 $\mu$ OS2 LSHF, Type B, Length: xx in m
TML-MPP/MPP09B48E-Bxx	tML <sup>®</sup> Xtended - FO Trunk Cable both sides 4xMPO/MTP <sup>®</sup> with Pins 48E9/125 $\mu$ OS2 LSHF, Type B, Length: xx in m
TML-MPP/MPP09B72E-Bxx	tML <sup>®</sup> Xtended - FO Trunk Cable both sides 6xMPO/MTP <sup>®</sup> with Pins 72E9/125 $\mu$ OS2 LSHF, Type B, Length: xx in m
TML-MPP/MPP09B96E-Bxx	tML <sup>®</sup> Xtended - FO Trunk Cable both sides 8xMPO/MTP <sup>®</sup> with Pins 96E9/125 $\mu$ OS2 LSHF, Type B, Length: xx in m