tML® 24 - FO Trunk Cable 1x 24F MPO w. Pins/1x 24F MPO w. Pins 24E9/125µ OS2 LSHF Type A, Length: xx in m

tML® tde Modular Link

tML® 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® 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 400G 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® 12, tML® 24, tML® 32 and now tML® 24+ System for extreme scalability and very easy migration to higher transmission rates such as 40G, 100G, 200G, 400G and 800G and more.

The tML® - FO trunk cable is intended for the connection of two tML®24 - FO Modules.

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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 hieght 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	24 Fiber SM Elite® ferrule, PPS
Boot colour	Red
Temperature range	-40°C to +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	1550 nm	≤ 0.10 dB	0.25 dB	75 dB

FO Fan-Out

Fan-out length	50 mm
Ø Fan-out	16 mm
Ø Single unit	3.8 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

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Repeated bending	IEC 60794-1-21 E6
Torsion	IEC 60794-1-21 E7
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
Reaction to fire (Euroclasses)	cIEC 61034-1/-2, EN 61034-1/-2, VDE 0482-1034-1/-2
Reaction to fire (Euroclasses)	EN 13501-6: D_{ca}

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	E9/125 G.652.D
No. of fibers	24
Loose tube	1
Sheath ø	8.2 mm
Weight	72 kg/km
Bending radius	125 mm
Tensile load short term	3,500 N
Tensile load continuous	1.500 N
Crush resistance short term	5.000 N
Crush resistance continuous	3.000 N
Fire load	336 kWh/km
	1210 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 λ0	1304 ≤λ0≤ 1324 nm

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Maximim Zero Dispersion Slope So	0.092 ps/(nm² x km)
Mode-Filed Diameter	9.2 +/- 0,4 µm
Maximum Cable Cut-off Wavelength λCC	1260 nm
PDM Link Design Value	≤ 0.04 ps/√km
Max. individual fibre PMD	≤ 0.1 ps/√km
Max. individual cable PMD	≤ 0.2 ps/√km
Refractive Index	1.4676

Mechanical properties

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

Product variants & accessories

Art.-No.	Description
TML-M2P/M2P09B24E-Axx	tML® 24 - FO Trunk Cable 1x 24F MPO w. Pins/1x 24F MPO w. Pins 24E9/125µ OS2 LSHF Type A, Length: xx in m
TML-M2P/M2P09B48E-Axx	tML® 24 - FO Trunk Cable 2x 24F MPO w. Pins/2x 24F MPO w. Pins 48E9/125µ OS2 LSHF Type A, Length: xx in m
TML-M2P/M2P09B72E-Axx	tML® 24 - FO Trunk Cable 3x 24F MPO w. Pins/3x 24F MPO w. Pins 72E9/125µ OS2 LSHF Type A, Length: xx in m
TML-M2P/M2P09B96E-Axx	tML® 24 - FO Trunk Cable 4x 24F MPO w. Pins/4x 24F MPO w. Pins 96E9/125µ OS2 LSHF Type A, Length: xx in m