

## Description

The tde patch and trunk cables are manufactured completely at the German facility in Ohrte. Production processes at tde meet the latest standards, and the company has one of the most up-to-date fiber optic assembly houses in Europe. Fiber optic patch cables and trunk cables are manufactured in many different configurations using highly automated processes on two independent mass production lines. The range of products on offer encompasses the entire spectrum of connector types available on the market. Production capacity is around 100,000 fiber optic connectors per month, and this can be ramped up easily whenever required. To guarantee consistently top quality, only the best components from renowned vendors are used. All tde production staff have the necessary qualifications and education, and have been well trained in using specialist technical equipment such as laser cleavers and glue-dispensing robots. Each cable application is subjected to a full test procedure comprising interferometer measurements, insertion loss and return loss measurements and a final visual inspection to ensure that only 100% error-free products are shipped to the customer.

Products made by tde perform at least internationally accepted quality standards and norms. The quality management system is ISO 9001, ISO 14001 and TL9000 certified.

## Technical Data

### FO Connectors

Type	E2000
Ferrule	Ceramic
Ferrule Hole	126 µ
Connector colour	Beige
Lever colour	Magenta
Boot colour	Black
Manufacturer	RDM

### Optical performance

Fiber	Type	Wavelength	Insertion loss typ.	Insertion loss max.	Return loss min.
50/125µ OM4	E2000	850 nm	≤ 0.25 dB	0.45 dB	30 dB

### FO Cables

Type	IVHH12G50/125 OM4
Fiber Amount	12
Construction	3 + 9
Outer Diameter	9.9 mm
Tolerance	± 0.5 mm

# FO Breakoutl cable 12x E2000/12x E2000 12G50/125µ OM4 LSHF, Length: xxxx

Subcable Diameter	2.0 (± 0.1mm)
Strength Members	Aramid yarns
Outer Jacket	LSOH (Halogen free, low smoke, flame retardant thermoplastic compound)
Jacket Colour	Magenta
Standard printing	“t d e – IVHH12G50-OM4-2.0” and sequential meter marking + Lot number

## Mechanical/ Thermal Characteristics

Fiber Amount	12
Weight	90 kg/km
Tensile load	1700 N
Bending radius	20 x outer diameter
Operating temperature	-5°C to + 60°C
Fire resistance	Pass EN 50266, IEC 60332-3
Halogen content	Free EN 50267, IEC 60754
Smoke density	Low EN 50268, IEC 61034-1/2

## Special features

Characteristics	Fiber and aramid yarn free movable in the compound
Identification	Numbers, min. every 25cm on subcables

## FO Fiber

Type	Corning ClearCurve® 50/125µ 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 ≤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

# FO Breakoutl cable 12x E2000/12x E2000 12G50/125µ OM4 LSHF, Length: xxxx

## 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. ≤ 2.3 dB/km At 1300 nm max. ≤ 0.6 dB/km
Macrobend Loss	Mandrel Radius (mm): 37.2 / 15 / 7.5 Number of Turns: 100 / 2 / 2 Induced Attenuation (dB) at 850 nm: ≤ 0.05 / ≤ 0.1 / 0.2 Induced Attenuation (dB) at 1300 nm: ≤ 0.15 / ≤ 0.3 / ≤ 0.5
Numerical Aperture	0.200 ± 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 ± 2.5 µm
Cladding Diameter	125.0 ± 1.0 µm
Core-Clad Concentricity	≤ 1.5 µm
Cladding Non-Circularity	≤ 1.0%
Core Non-Circularity	≤ 5.0%
Coating Diameter	242 ± 5 µm
Coating-Cladding Concentricity	< 12 µm

## 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 ± 2°C	≤ 0.20
Heat Aging	85°C ± 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 <sup>2</sup> ).
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# FO Breakoutl cable 12x E2000/12x E2000 12G50/125μ OM4 LSHF, Length: xxxx

Length	Fiber lengths available up to 17.6 km/spool.
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## 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 ( $\lambda_0$ ): 1295 nm $\leq \lambda_0 \leq$ 1315 nm Zero Dispersion Slope ( $S_0$ ): $\leq 0.101$ ps/(nm <sup>2</sup> *km)

Art.-No.	Description
L-E2/E2-50V04G4-xxxx	FO Breakoutl cable 4x E2000/4x E2000 4G50/125μ OM4 LSHF, Length: xxxx
L-E2/E2-50V08G4-xxxx	FO Breakoutl cable 8x E2000/8x E2000 8G50/125μ OM4 LSHF, Length: xxxx
L-E2/E2-50V12G4-xxxx	FO Breakoutl cable 12x E2000/12x E2000 12G50/125μ OM4 LSHF, Length: xxxx
L-E2/E2-50V24G4-xxxx	FO Breakoutl cable 24x E2000/24x E2000 24G50/125μ OM4 LSHF, Length: xxxx