# tDF® - FO Premium splice to patch module 12x E2000 PC SM 3U/7HP with pigtails 9/125µ w. 5,0mm flex tube



## tDF® - tde Distribution Frame (ODF)

tDF® is a modular Central Office solution with the highest packing density. At 46U, up to 4032 fibers can be terminated with LC. In developing the tde has taken primarily attention on the user-friendly installation. So the patented modules are fully be fitted from the front. A 19-inch sub rack occupies three height units and is equipped with twelve splice modules. Per sub rack, up to 288 fibers can be terminated with LC. The splices will be stored in standard splice cassettes. A unique feature of the splice module is the built-in loose tube over length management, which compared to conventional solutions saves an additional rack unit for the over length tray. The trunk cables are brought to the sub rack side and splitted there. This results in very short stripping lengths for the trunk cables. Due to the tML® compatibility also MPO/MTP® modules can be equipped in the same sub rack. The modular design of the tDF rack system offers maximum flexibility. The racks can be ordered customized completely preconfigured.

**tde® 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

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## Technical Data

| | |
|---|---|
| Dimensions | 3U/7HP |
| Pre-mounted | 12 E2000 PC adapters<br>12 E2000 PC Fiber pigtails 9/125µ OS2<br>12 Crimp Splice protectors<br>1 Splice cassettes<br>1 Splice holder<br>1 Splice cover<br>1,6m Flex tube |
| Alternative pre-mounted | TDF-M12-xxE2-9PS |
| xx | (01 - 12) quantity of adapters |

### FO Adapters

| | |
|---|---|
| Standardisation | acc. to IEC61754-15, DIN EN 186270 |
| Connector class | coupling Adapter |
| Number of connectors (A) | 1 |
| Connector type (A) | E2000™ |
| Protection class (IP) connector (A) | 20 |
| Polishing connector (A) | PC |
| Attenuation grade IL - connector (A) | C |
| Delta insertion loss | ≤ 0.2 dB, testing method acc. to IEC 61300-3-4 |
| Mating cycles | min. 1000 |
| Pull-out force | min. 70 N |
| Connector color (A) | blue |
| Lever- frame-coding connector (A) | color |
| Frame color connector (A) | blue |
| Sleeve material | ceramic |
| Adapter fastening method | end cap |
| Fiber type | Singlemode (SM) |
| Dimensions | 74.7 / 42 x 22 x 9.35 mm |
| Material | plastic: PBT, fiber-glass reinforced (halogen-free) |
| Manufacturer | R&M |

### FO Pigtails Premium

### FO Connectors

| | |
|---|---|
| Type | E2000 UPC |
| Ferrule | Ceramic |
| Ferrule Hole | 125.5 µ |
| Ferrule Concentricity | ≤ 0.6 µ |
| Connector colour | Blue |
| Lever Colour | Blue |


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| | |
|---|---|
| Boot colour | Blue |
| Manufacturer | RDM |

### Optical performance

| Fiber | Type | Wavelength | Insertion loss typ. | Insertion loss max. | Return loss min. |
|---|---|---|---|---|---|
| 9/125µ | E2000 UPC | 1550 nm | ≤ 0.10 dB | 0.25 dB | 55 dB |

## FO Cables

| | |
|---|---|
| Tight Buffer | Low smoke (IEC 61034 and EN 50268) and free of halogens (LS0H) |
| | Non corrosive after IEC 60754-2 and EN 50267 |
| | Flame resistent after IEC 60332-3C and EN 50266-2-4 |
| | Completly dry design |
| | Free from metal, no grounding problems and potential differences |
| | Tight Buffer for simple and direct connector mounting |

### Characteristics

| | |
|---|---|
| Fiber Count | 1 (Tight Buffer) |
| Core-Ø | 0.9 mm |
| Coreweight | 1 kg/km |
| Min. Bending radius - Installation | 30 mm |
| Min. Bending radius - Operation | 30 mm |
| Removal | 1500 mm |
| Fire load | 0.15 MJ/m |
| Temperature range - Installation | -5 to +50°C |
| Temperature range - Operation | -20 to +60°C |
| Temperature range - Transport / Lagerung | -25 to +70°C |

## FO Fiber

| | |
|---|---|
| Type | Corning Ultra SMF-28® 09/125µ OS2 singlemode fiber |
| Maximum Attenuation | At 1310 nm max. 0.32 dB/km<br>At 1383 nm max. 0.32 dB/km<br>At 1490 nm max. 0.21 dB/km<br>At 1550 nm max. 0.18 dB/km<br>At 1625 nm max. 0.20 dB/km |
| Attenuation vs. Wavelength | Range: 1285 - 1330 mm; Ref. λ: 1310 nm; Max. Difference: 0.03 dB/km<br>Range: 1525 - 1575 mm; Ref. λ: 1550 nm; Max. Difference: 0.02 dB/km |


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| | |
|---|---|
| Macrobend Loss | Mandrel Radius: 10mm; Number of Turns: 1; Wavelength: 1550nm; Induced Attenuation: ≤ 0.50 dB<br>Mandrel Radius: 10mm; Number of Turns: 1; Wavelength: 1625nm; Induced Attenuation: ≤ 1.5 dB<br>Mandrel Radius: 15mm; Number of Turns: 10; Wavelength: 1550nm; Induced Attenuation: ≤ 0.05 dB<br>Mandrel Radius: 15mm; Number of Turns: 10; Wavelength: 1625nm; Induced Attenuation: ≤ 0.30 dB<br>Mandrel Radius: 25mm; Number of Turns: 100; Wavelength: 1310nm, 1550nm, 1625nm; Induced Attenuation: ≤ 0.01 dB |
| Point Discontinuity | Wavelength: 1310 nm; Point Discontinuity: ≤ 0.05 dB<br>Wavelength: 1550 nm; Point Discontinuity: ≤ 0.05 dB |
| Cable Cutoff Wavelength (λccf) | λccf ≤ 1260 nm |
| Mode-Field Diameter | At 1310 nm = 9.2 ± 0.4 µm<br>At 1550 nm = 10.4 ± 0.5 µm |
| Dispersion | At 1550 nm = ≤ 18.0 [ps/(nm*km)]<br>At 1625 nm = ≤ 22.0 [ps/(nm*km)] |
| | Zero Dispersion Wavelength ($\lambda_0$): 1304 nm ≤$\lambda_0$≤ 1324 nm<br>Zero Dispersion Slope ($S_0$): ≤ 0.092 ps/(nm² *km) |
| Polarization Mode Dispersion (PMD) | PMD Link Design Value = ≤ 0.04 ps/√km<br>Maximum Individual Fiber = ≤ 0.1 ps/√km |

## Dimensional Specifications

| | |
|---|---|
| Fiber Curl | ≥ 4.0 m radius of curvature |
| Cladding Diameter | 125.0 ± 0.7 µm |
| Core-Clad Concentricity | ≤ 0.5 µm |
| Cladding Non-Circularity | ≤ 0.7% |
| Coating Diameter | 242 ± 5 µm |
| Coating-Cladding Concentricity | < 12 µm |

## Environmental Specifications

| Environmental Test | Test Condition | Induced Attenuation 1310 nm, 1550 nm & 1625 nm |
|---|---|---|
| Temperature Dependence | -60°C to +85°C | ≤ 0.05 |
| Temperature Humidity Cycling | -10°C to +85°C up to 98% RH | ≤ 0.05 |
| Water Immersion | 23°C ± 2°C | ≤ 0.05 |
| Heat Aging | 85°C ± 2°C | ≤ 0.05 |
| Operating Temperature Range | -60°C to +85°C | |

## Mechanical Specifications

| | |
|---|---|
| Proof Test | The entire fiber length is subjected to a tensile stress ≥ 100 kpsi (0.69 GPa). |
| Length | Fiber lengths available up to 63.0 km/spool. |

## Performance Characterizations

| | |
|---|---|
| Core Diameter | 8.2 µm |
| Numerical Aperture | 0.14 |


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| | |
|---|---|
| Effective Group Index of Refraction | 1310 nm: 1.4676<br>1550 nm: 1.4682 |
| Fatigue Resistance Parameter (nd) | 20 |
| Coating Strip Force | Dry: 0.6 lbs (3N)<br>Wet: 14 days room temperature: 0.6 lbs (3N) |
| Rayleigh Backscatter Coefficient (for 1 ns Pulse Width) | 1310 nm: -77 dB<br>1550 nm: -82 dB |

## Product variants & accessories

| Art.-No. | Description |
|---|---|
| TDF-M12-12E2-9PS-5 | tDF® - FO Premium splice to patch module 12x E2000 PC SM 3U/7HP with pigtails 9/125µ w. 5,0mm flex tube |
| TDF-M12-12E2A9APS-5 | tDF® - FO Premium splice to patch module 12x E2000 APC SM 3U/7HP with pigtails 9/125µ w. 5,0mm flex tube |


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