

Optical Fibers

Fibrain G.657.A1 fiber



OVERVIEW:

An increasing number of applications require high fiber-core density or tight bending radii, therefore bend-insensitive fibers become more and more popular in optical networks. They typically offer the well-known attenuation and dispersion characteristics of the basic G.652D fiber, with the added benefit of much smaller macrobending losses. Although theoretically fully compatible with the G.652D, in practice some aspects (like splicing) of many nominally G.652D-compliant fibers often require careful examination. Fibrain G.657A1 fiber guarantees full optical and practical compatibility with the G.652D fibers, at the same time delivering consistent and robust macrobending performance. Fibrain G.657A1 fiber is proudly manufactured in the EU.

APPLICATIONS:

- Access networks
- Indoor FTTH applications
- Microcables
- Other telecommunication cables

FEATURES:

- G.657.A1 and G.652.D-compliant
- Reliable macrobending performance
- Low attenuation
- Available as colored and ring-marked
- Made in the EU

TECHNICAL SPECIFICATIONS:

| Optical parameters, attenuation and loss | Value | Unit | Comments |
|--|------------------------|---------|---------------------------|
| Attenuation at 1310 nm | typ. ≤0.33, max. ≤0.34 | dB/km | |
| Attenuation at 1383 nm | typ. ≤0.29, max. ≤0.34 | dB/km | After hydrogen aging |
| Attenuation at 1490 nm | typ. ≤0.22, max. ≤0.23 | dB/km | |
| Attenuation at 1550 nm | typ. ≤0.19, max. ≤0.21 | dB/km | |
| Attenuation at 1625 nm | typ. ≤0.21, max. ≤0.23 | dB/km | For colored fiber |
| Attenuation uniformity 1285-1330 nm | ≤0.03 | dB/km | With reference to 1310 nm |
| Attenuation uniformity 1525-1575 nm | ≤0.02 | dB/km | With reference to 1550 nm |
| Point loss discontinuity at 1310 nm | ≤0.05 | dB | |
| Point loss discontinuity at 1550 nm | ≤0.05 | dB | |
| Macrobending loss | | | |
| 15 mm radius mandrel | 10 turns | 1550 nm | ≤0.25 dB |
| 15 mm radius mandrel | 10 turns | 1625 nm | ≤1.00 dB |
| 10 mm radius mandrel | 1 turn | 1550 nm | ≤0.75 dB |
| 10 mm radius mandrel | 1 turn | 1625 nm | ≤1.50 dB |

Fully Rec. ITU-T G.657.A1 compliant

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| Optical parameters, modal | Value | Unit | Comments |
|--|-----------|------|----------------------|
| Mode field diameter at 1310 nm | 9.1 ±0.4 | µm | |
| Mode field diameter at 1550 nm | 10.2 ±0.5 | µm | |
| Cut-off wavelength | ≤1260 | nm | Cable cut-off |
| Effective group index at 1310 nm | 1.466 | | |
| Effective group index at 1550 nm | 1.467 | | |
| Rayleigh backscattering coefficient at 1310 nm | -78 | dB | For 1 ns pulse width |
| Rayleigh backscattering coefficient at 1550 nm | -82 | dB | |

| Optical parameters, dispersion | Value | Unit | Comments |
|--|-----------|-----------------------|-------------------------|
| Zero dispersion wavelength | 1304-1324 | nm | |
| Zero dispersion slope | ≤0.092 | ps/km/nm ² | |
| Chromatic dispersion in 1285-1330 nm range | ≤ 3.4 | ps/km/nm | |
| Chromatic dispersion at 1550 nm | ≤18.0 | ps/km/nm | |
| Chromatic dispersion at 1625 nm | ≤22.0 | ps/km/nm | |
| PMD link design value | ≤0.06 | ps/km ^{1/2} | M=20, Q=0.01% |
| Max. individual fiber PMD | ≤0.20 | ps/km ^{1/2} | Free tension conditions |

| Geometrical and mechanical parameters | Value | Unit | Comments |
|---------------------------------------|------------|------|-----------------------------------|
| Cladding diameter | 125.0 ±0.7 | µm | |
| Core-cladding concentricity | ≤0.5 | µm | |
| Cladding non-circularity | ≤0.7 | % | |
| Fiber curl radius | ≥4 | m | |
| Coating diameter | 242.0 ±5.0 | µm | Neutral/uncolored |
| Coating-cladding concentricity | ≤12.0 | µm | |
| Proof-test level | 100 | kpsi | Other proof-test levels available |
| Dynamic fatigue parameter | ≥20 | | |
| Delivery length | 50.4 | km | Other lengths available |
| Strip force, peak | 1.3-8.9 | N | |
| Strip force, average | 1.5 ±0.5 | N | |

| Environmental performance | Test conditions | Attenuation change | Unit |
|------------------------------|------------------------|--------------------|-------|
| Temperature dependence | -60°C to +85°C | ≤0.05 | dB/km |
| Temperature-humidity cycling | -10°C to +85°C, 98% RH | ≤0.05 | dB/km |
| Water immersion | +23°C ±2°C | ≤0.05 | dB/km |
| Dry heat aging | +85°C ±2°C | ≤0.05 | dB/km |
| Damp heat aging | +85°C ±2°C, 85% RH | ≤0.05 | dB/km |

| | | |
|------------|------------------------------|------------|
| Type: | Fibrain Optical Fiber series | 02.01.2023 |
| | | REV: 1.3 |
| | | MD |
| Reference: | Z2-F-FIB-657A1-... | |

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ORDERING SYSTEM:

| Series | Fiber standard | Nominal coating diameter | Ring marking scheme | Color |
|----------|----------------|--------------------------|----------------------|----------------|
| Z2-F-FIB | 657A1 | 250 | 00 – no ring marking | NT - neutral |
| | | | 00 – scheme 1 | BK – black |
| | | | | BL – blue |
| | | | | BR – brown |
| | | | | GR – green |
| | | | | GY – grey |
| | | | | OR – orange |
| | | | | PK – pink |
| | | | | RD – red |
| | | | | TQ – turquoise |
| | | | | VL – violet |
| | | | | WH – white |
| | | | | YL – yellow |

Example: Z2-F-FIB-657A1-250-00-RD – Fibrain G.657.A1 fiber, nominal coating diameter 250 µm, no ring-marking, red-colored.

Important notice

Buyer and/or user of this product has to make sure before using this product that it is suitable for the intended use. All questions of liability relating to this product are subject – in accordance with the prevailing – to the Terms of Sales of the selling Fibrain subsidiary.