

## Enhanced Single-Mode Fibre

### ITU-T G.652.D



Issue date: November 2023  
Supersedes: August 2010

#### Applicable Standards

- IEC / EN 60793-2-50 type B-652.D
- ITU-T Recommendation G.652.D

#### Optical Specifications

##### Attenuation

Attribute	Units	1310 nm	1383 nm <sup>1</sup>	1460 nm	1550 nm	1625 nm
Attenuation	dB/km	≤ 0.35	≤ 0.35	≤ 0.25	≤ 0.21	≤ 0.23

<sup>1</sup> Including H2-aging according to IEC 60793-2-50, type B.1.3

##### Attenuation vs. Wavelength

Wavelength Range (nm)	Reference λ (nm)	(dB/km)
1285 – 1330	1310	≤ 0.03
1525 - 1575	1550	≤ 0.02
1460 - 1625	1550	≤ 0.04

##### Point discontinuities

No point discontinuity greater than 0.05 dB at 1310 nm and 1550 nm.

##### Attenuation variation vs. Bending

Number of Turns	Wavelength (nm)	Induced Attenuation (dB)
100 turns on a R = 25 mm mandrel	1310 / 1550	≤ 0.05
100 turns on a R = 30 mm mandrel	1625	≤ 0.05

##### Mode Field Diameter

Wavelength (nm)	Units	MFD
1310	μm	9.0 ± 0.4
1550	μm	10.1 ± 0.5

**Cutoff Wavelength**

Cable Cutoff Wavelength ( $\lambda_{ccf}$ )	$\leq 1260$ nm
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**Chromatic Dispersion**

Wavelength (nm)	Units	Chromatic Dispersion
In the interval 1285 – 1330	ps/[nm.km]	$\leq  3 $
At 1550	ps/[nm.km]	$\leq 18.0$
At 1625	ps/[nm.km]	$\leq 22.0$
Zero Dispersion Wavelength, $\lambda_0$	nm	1300 - 1324
Slope ( $S_0$ ) at $\lambda_0$	ps/(nm <sup>2</sup> · km)	$\leq 0.092$

**Polarization Mode Dispersion (PMD)**

Attribute	Units	Specified Values
PMD Link Design Value <sup>2</sup>	ps/ $\sqrt{km}$	$\leq 0.06$
Max. individual Fiber	ps/ $\sqrt{km}$	$\leq 0.1$

<sup>2</sup> According to IEC 60794 –3, Ed 3 (Q=0.01%)

**Typical Values**

Attribute	Units	1310 nm	1550 nm	1625 nm
Effective group index	-	1.467	1.468	1.468
Rayleigh Backscatter Coefficient for 1 ns pulse width	dB	- 79.4	- 81.7	- 82.5

**Geometrical Specifications**

**Glass Geometry**

Attribute	Units	Specified Values
Cladding Diameter	$\mu\text{m}$	$125.0 \pm 0.7$
Core - Cladding Concentricity Error	$\mu\text{m}$	$\leq 0.5$
Cladding non-Circularity	%	$\leq 0.7$
Fiber Curl (radius)	m	$\geq 4$

**Coating Geometry**

Attribute	Units	Specified Values
Coating Diameter	$\mu\text{m}$	$242 \pm 7$
Coating - Cladding Concentricity Error	$\mu\text{m}$	$\leq 12$
Coating non-Circularity	%	$\leq 5$

**Mechanical Specifications**

**Proof Test <sup>3</sup>**

The entire spool length is subjected to a tensile proof stress  $\geq 0.7$  GPa (100 kpsi) ; 1% strain equivalent

<sup>3</sup> Higher proof test available upon request

**Coating Performance**

Attribute	Units	Specified Values
Average Coating Strip Force, unaged and aged <sup>4</sup>	N	$1 \leq F_{\text{avg-strip}} \leq 3$
Peak Coating Strip Force, unaged and aged <sup>4</sup>	N	$1.2 \leq F_{\text{peak-strip}} \leq 8.9$

<sup>4</sup> Aging at 23°C, 30 days

**Fibre Strength**

Attribute	Units	Specified Values
Dynamic Tensile Strength (0.5 meter gauge length), unaged and aged <sup>5</sup>	GPa	median > 3.8 (550 kpsi)
Dynamic Fatigue, unaged and aged <sup>5</sup>	-	$n_d \geq 20$

<sup>5</sup> Aging at 85°C, 85% RH, 30 days

**Environmental Specifications**

Environmental test	Test Conditions	Induced attenuation at 1550, 1625 nm (dB/km)
Temperature Cycling	- 60°C to 85°C	$\leq 0.05$
Temperature - Humidity Cycling	- 10°C to 85°C, 4-98% RH	$\leq 0.05$
Water Immersion	14 days; 23°C	$\leq 0.05$
Dry Heat	30 days; 85°C	$\leq 0.05$
Damp Heat	30 days; 85°C; 85% RH	$\leq 0.05$

**Others**

Length	Up to 50.4 km per spool
Coating	Acrylate coating; ColorLock™ XS and Clear

All measurements in accordance with ITU-T G650 recommendations