

Enhanced Single-Mode Fibre

ITU-T G.652.D



Issue date: November 2020
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 ¹	1460 nm	1550 nm	1625 nm
Attenuation	dB/km	≤ 0.35	≤ 0.35	≤ 0.25	≤ 0.21	≤ 0.23

¹ 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 (λ_{ccf})	≤ 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]	≤ 18.0
At 1625	ps/[nm.km]	≤ 22.0
Zero Dispersion Wavelength, λ_0	nm	1300 - 1324
Slope (S_0) at λ_0	ps/(nm ² · km)	≤ 0.092

Polarization Mode Dispersion (PMD)

Attribute	Units	Specified Values
PMD Link Design Value ²	ps/ \sqrt km	≤ 0.06
Max. individual Fiber	ps/ \sqrt km	≤ 0.1

² 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	μ m	125.0 ± 0.7
Core - Cladding Concentricity Error	μ m	≤ 0.5
Cladding non-Circularity	%	≤ 0.7
Fiber Curl (radius)	m	≥ 4

Coating Geometry

Attribute	Units	Specified Values
Coating Diameter	μ m	242 ± 7
Coating - Cladding Concentricity Error	μ m	≤ 12
Coating non-Circularity	%	≤ 5

Mechanical Specifications

Proof Test ³

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

³ Higher proof test available upon request

Coating Performance

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

⁴ Aging at 23°C, 30 days

Fibre Strength

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

⁵ Aging at 85°C, 85% RH, 30 days

Environmental Specifications

Environmental test	Test Conditions	Induced attenuation at 1310, 1550 nm (dB/km)
Temperature Cycling	- 60°C to 85°C	≤ 0.05
Temperature - Humidity Cycling	- 10°C to 85°C, 4-98% RH	≤ 0.05
Water Immersion	14 days; 23°C	≤ 0.05
Dry Heat	30 days; 85°C	≤ 0.05
Damp Heat	30 days; 85°C; 85% RH	≤ 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