Properties of Enhanced Single-Mode Fibre

Tight Buffer SM_G.652.D

APPLICABLE STANDARDS

- IEC / EN 60793-2-50 Category B-652.D
- ITU Recommendation G.652.D
- EN 50 173-1: Category OS2 and OS1a
- ISO / IEC 11801: Category OS2 and OS1a

- All measurements are in accordance with ITU-T G.650 Recommendation

GENERAL

Tight buffered fibre consists of dual acrylate primary coating to nominally 245µm and a secondary LSOH or PVC buffer to 900µm. The buffer is extruded around the primary coating in order to make a versatile, and robust buffering system.

Where required to facilitate splicing or termination, all fibre coatings may be easily removed simultaneously to a length of at least 60mm, typically using three stripping actions 15 – 25 mm each, with commercially available mechanical stripping tools.

ATTENUATION IN CABLE

Attribute	Measurement method	Units	Limits
Maximum attenuation in cable at 1310 nm	IEC/EN 60793-1-40	dB/km	≤ 0.40
Maximum attenuation in cable at 1383 nm (1)	IEC/EN 60793-1-40	dB/km	≤ 0.40
Maximum attenuation in cable at 1550 nm	IEC/EN 60793-1-40	dB/km	≤ 0.30
Maximum attenuation in cable at 1625 nm	IEC/EN 60793-1-40	dB/km	≤ 0.30
Local discontinuity at 1310 and 1550 nm	IEC/EN 60793-1-40	dB	≤ ± 0.1

(1) including H2-ageing according to IEC 60793-2-50, type B.1.3, at 1383 nm.

OPTICAL PROPRIETIES OF FIBRE

Attribute	Measurement method	Units	Limits
Mode field diameter at 1310 nm	IEC/EN 60793-1-45	µm	9.0 ± 0.4
Mode field diameter at 1550 nm	IEC/EN 60793-1-45	µm	10.1 ± 0.5
Chromatic Dispersion coefficient:	IEC/EN 60793-1-42		
• in the interval 1285 nm – 1330 nm		ps/km · nm	≤ |3.5|
• at 1550 nm		ps/km · nm	≤ 18
• at 1625 nm		ps/km · nm	≤ 22
Zero Dispersion Wavelength, λ_0		nm	1302 – 1322
Zero Dispersion Slope		ps/(nm² · km)	≤ 0.092
Cut-off Wavelength, λ_{cc}	IEC/EN 60793-1-44	nm	≤ 1260 (2)
Polarisation Mode Dispersion (PMD) coefficient	IEC/EN 60793-1-48	ps/√km	≤ 0.1 (3)
PMD_Q Link Design Value (computed with Q=0.01%, N=20)	IEC/EN 60794-3	ps/√km	≤ 0.06 (3)

(2) guaranteed value according to the ITU-T (ATM G650) method.

(3) PMD may change when fibre is cabled.

ATTENUATION VARIATION VS BENDING

Attribute	Measurement method	Units	Limits
100 Turns on a R = 25 mm mandrel at 1310 & 1550 nm	IEC/EN 60793-1-47	dB	≤ 0.05
100 Turns on a R = 30 mm mandrel at 1625 nm	IEC/EN 60793-1-47	dB	≤ 0.05

GROUP INDEX OF REFRACTION

Attribute	Measurement method	Units	Limits
1310 nm	IEC/EN 60793-1-22	-	1.467
1550 nm	IEC/EN 60793-1-22	-	1.468
1625 nm	IEC/EN 60793-1-22	-	1.468

RAYLEIGH BACKSCATTER COEFFICIENT (1NS PULSE WIDTH)

Attribute	Measurement method	Units	Limits
1310 nm	-	dB	-79.4
1550 nm	-	dB	-81.7
1625 nm	-	dB	-82.5

GEOMETRICAL PROPERTIES

Attribute	Measurement method	Units	Limits
Cladding diameter	IEC/EN 60793-1-20	µm	125.0 ± 0.7
Cladding non-Circularity	IEC/EN 60793-1-20	%	≤ 0.7
Core-Cladding Concentricity error	IEC/EN 60793-1-20	µm	≤ 0.5
Coating diameter (nominal)	IEC/EN 60793-1-21	µm	245
Coating non-Circularity	IEC/EN 60793-1-21	%	≤ 5
Coating-Cladding Concentricity error	IEC/EN 60793-1-21	µm	≤ 12
Tight buffer diameter		µm	900 ± 50

MECHANICAL PROPERTIES

Attribute	Measurement method	Units	Limits
Proof stress level	IEC/EN 60793-1-30	GPa	≥ 0.7 (≈ 1 %)
Strip force (average)	IEC/EN 60793-1-32	N	$1 \leq F_{average.strip} \leq 3$
Strip force (peak)	IEC/EN 60793-1-32	N	$1.2 \leq F_{peak.strip} \leq 8.9$
Dynamic Fatigue Resistance, aged and unaged	IEC/EN 60793-1-33	-	$n_d \geq 20$

Properties of OM3 50µm Multimode Fibre

Tight Buffer OM3

APPLICABLE STANDARDS

- IEC / EN 60793-2-10: type A1-OM3
- TIA/EIA-492 AAAF (formerly AAAC)
- ITU-T G.651.1
- ISO/IEC 11801: Category OM3
- ANSI/TIA/EIA-568.3-D

GENERAL

Tight buffered fibre consists of dual acrylate primary coating to nominally 245µm and a secondary LSOH or PVC buffer to 900µm. The buffer is extruded around the primary coating in order to make a versatile, and robust buffering system.

Where required to facilitate splicing or termination, all fibre coatings may be easily removed simultaneously to a length of at least 60mm, typically using three stripping actions 15 – 25 mm each, with commercially available mechanical stripping tools.

ATTENUATION IN CABLE

Attribute	Measurement method	Units	Limits
Maximum attenuation in cable at 850 nm	IEC/EN 60793-1-40	dB/km	≤ 3.0
Maximum attenuation in cable at 1300 nm	IEC/EN 60793-1-40	dB/km	≤ 1.0
Point Discontinuity at 850 nm and 1300 nm	IEC/EN 60793-1-40	dB	≤ ± 0.1

BANDWIDTH

Attribute	Measurement method	Units	Limits
Overfilled (OFL) modal bandwidth at 850 nm	IEC/EN 60793-1-41	MHz · km	≥ 1500
Overfilled (OFL) modal bandwidth at 1300 nm	IEC/EN 60793-1-41	MHz · km	≥ 500
Effective Modal Bandwidth (EMB) at 850 nm	IEC 60793-1-49	MHz · km	≥ 2000

ATTENUATION VARIATION VS BENDING

Attribute	Measurement method	Units	Limits
2 Turns on a R = 7.5 mm mandrel at 850 / 1300 nm	IEC/EN 60793-1-40	dB	≤ 0.2 / ≤ 0.5
2 Turns on a R = 15 mm mandrel at 850 / 1300 nm	IEC/EN 60793-1-40	dB	≤ 0.1 / ≤ 0.3

OPTICAL PROPERTIES

Attribute	Measurement method	Units	Limits
Numerical aperture	IEC/EN 60793-1-43	-	0.200 ± 0.015

GROUP INDEX OF REFRACTION

Attribute	Measurement method	Units	Limits
850 nm	IEC/EN 60793-1-22	-	1.482
1300 nm	IEC/EN 60793-1-22	-	1.477

GEOMETRICAL PROPERTIES

Attribute	Measurement method	Units	Limits
Core diameter	IEC/EN 60793-1-20	µm	50 ± 2.5
Core non-Circularity	IEC/EN 60793-1-20	%	≤ 5
Core-Cladding Concentricity error	IEC/EN 60793-1-20	µm	≤ 1.5
Cladding diameter	IEC/EN 60793-1-20	µm	125.0 ± 1.0
Cladding non-Circularity	IEC/EN 60793-1-20	%	≤ 1.0
Coating diameter	IEC/EN 60793-1-21	µm	245 ± 15
Coating non-Circularity	IEC/EN 60793-1-21	%	≤ 5
Coating-Cladding Concentricity error	IEC/EN 60793-1-21	µm	≤ 10
Tight buffer diameter		µm	900 ± 50

MECHANICAL PROPERTIES

Attribute	Measurement method	Units	Limits
Proof stress level	IEC/EN 60793-1-30	GPa	≥ 0.7 (≈ 1 %)
Strip force (typical)	IEC/EN 60793-1-32	N	$1.0 \leq F_{avg.strip} \leq 3.0$
Strip force (peak)	IEC/EN 60793-1-32	N	$1.3 \leq F_{peak.strip} \leq 8.9$
Dynamic Fatigue Resistance, aged and unaged	IEC/EN 60793-1-33	-	$n_d \geq 20$

Properties of OM4 50µm Multimode Fibre

Tight Buffer OM4

APPLICABLE STANDARDS

- IEC / EN 60793-2-10: type A1-OM4
- TIA/EIA-492 AAAF (formerly 492 AAAD)
- ITU-T G.651.1
- ISO/IEC 11801: Category OM4
- ANSI/TIA/EIA-568.3-D

GENERAL

Tight buffered fibre consists of dual acrylate primary coating to nominally 245µm and a secondary LSOH or PVC buffer to 900µm. The buffer is extruded around the primary coating in order to make a versatile, and robust buffering system.

Where required to facilitate splicing or termination, all fibre coatings may be easily removed simultaneously to a length of at least 60mm, typically using three stripping actions 15 – 25 mm each, with commercially available mechanical stripping tools.

ATTENUATION IN CABLE

Attribute	Measurement method	Units	Limits
Maximum attenuation in cable at 850 nm	IEC/EN 60793-1-40	dB/km	≤ 3.0
Maximum attenuation in cable at 1300 nm	IEC/EN 60793-1-40	dB/km	≤ 1.0
Point Discontinuity at 850 nm and 1300 nm	IEC/EN 60793-1-40	dB	≤ ± 0.1

BANDWIDTH

Attribute	Measurement method	Units	Limits
Overfilled (OFL) modal bandwidth at 850 nm	IEC/EN 60793-1-41	MHz · km	≥ 3500
Overfilled (OFL) modal bandwidth at 1300 nm	IEC/EN 60793-1-41	MHz · km	≥ 500
Effective Modal Bandwidth (EMB) at 850 nm	IEC 60793-1-49	MHz · km	≥ 4700

ATTENUATION VARIATION VS BENDING

Attribute	Measurement method	Units	Limits
2 Turns on a R = 7.5 mm mandrel at 850 / 1300 nm	IEC/EN 60793-1-40	dB	≤ 0.2 / ≤ 0.5
2 Turns on a R = 15 mm mandrel at 850 / 1300 nm	IEC/EN 60793-1-40	dB	≤ 0.1 / ≤ 0.3

OPTICAL PROPERTIES

Attribute	Measurement method	Units	Limits
Numerical aperture	IEC/EN 60793-1-43	-	0.200 ± 0.015

GROUP INDEX OF REFRACTION

Attribute	Measurement method	Units	Limits
850 nm	IEC/EN 60793-1-22	-	1.482
1300 nm	IEC/EN 60793-1-22	-	1.477

GEOMETRICAL PROPERTIES

Attribute	Measurement method	Units	Limits
Core diameter	IEC/EN 60793-1-20	µm	50 ± 2.5
Core non-Circularity	IEC/EN 60793-1-20	%	≤ 5
Core-Cladding Concentricity error	IEC/EN 60793-1-20	µm	≤ 1.5
Cladding diameter	IEC/EN 60793-1-20	µm	125.0 ± 1.0
Cladding non-Circularity	IEC/EN 60793-1-20	%	≤ 1.0
Coating diameter	IEC/EN 60793-1-21	µm	245 ± 15
Coating non-Circularity	IEC/EN 60793-1-21	%	≤ 5
Coating-Cladding Concentricity error	IEC/EN 60793-1-21	µm	≤ 10
Tight buffer diameter		µm	900 ± 50

MECHANICAL PROPERTIES

Attribute	Measurement method	Units	Limits
Proof stress level	IEC/EN 60793-1-30	GPa	≥ 0.7 (≈ 1 %)
Strip force (typical)	IEC/EN 60793-1-32	N	$1.0 \leq F_{avg.strip} \leq 3.0$
Strip force (peak)	IEC/EN 60793-1-32	N	$1.3 \leq F_{peak.strip} \leq 8.9$
Dynamic Fatigue Resistance, aged and unaged	IEC/EN 60793-1-33	-	$n_d \geq 20$