

Properties of Enhanced Single-Mode Fibre

Flextube 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

ATTENUATION IN CABLE

Attribute	Measurement method	Units	Limits
Maximum attenuation in cable at 1310 nm	IEC/EN 60793-1-40	dB/km	≤ 0.36
Maximum attenuation in cable at 1383 nm ⁽¹⁾	IEC/EN 60793-1-40	dB/km	≤ 0.36
Maximum attenuation in cable at 1550 nm	IEC/EN 60793-1-40	dB/km	≤ 0.23
Maximum attenuation in cable at 1625 nm	IEC/EN 60793-1-40	dB/km	≤ 0.26
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 PROPERTIES 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/(nm ² · 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

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	$1 \leq F_{\text{average,strip}} \leq 3$
Strip force (peak)	IEC/EN 60793-1-32	N	$1.2 \leq F_{\text{peak,strip}} \leq 8.9$
Dynamic Fatigue Resistance, aged and unaged	IEC/EN 60793-1-33	-	$n_d \geq 20$

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Properties of BendBright™ XS Single-Mode Fibre

Flextube SM_G.657.A2 BBXS (C24)



APPLICABLE STANDARDS

- IEC / EN 60793-2-50 Category B-657.A2 and B-652.D
- ITU Recommendation G.657.A2 and G.657.B2
- ITU-T 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

ATTENUATION IN CABLE

Attribute	Measurement method	Units	Limits
Maximum attenuation in cable at 1310 nm	IEC/EN 60793-1-40	dB/km	≤ 0.38
Maximum attenuation in cable at 1383 nm ⁽¹⁾	IEC/EN 60793-1-40	dB/km	≤ 0.38
Maximum attenuation in cable at 1550 nm	IEC/EN 60793-1-40	dB/km	≤ 0.23
Maximum attenuation in cable at 1625 nm	IEC/EN 60793-1-40	dB/km	≤ 0.25
Local discontinuity at 1310 and 1550 nm	IEC/EN 60793-1-40	dB	max. 0.1

(1) including H2-ageing according to IEC 60793-2-50, type B1.3, at 1383 nm.

OPTICAL PROPRIETIES OF FIBRE

Attribute	Measurement method	Units	Limits
Mode field diameter at 1310 nm	IEC/EN 60793-1-45	µm	8.8 ± 0.4
Mode field diameter at 1550 nm	IEC/EN 60793-1-45	µm	9.8 ± 0.5
Chromatic Dispersion coefficient:	IEC/EN 60793-1-42		
• in the interval 1285 nm – 1330 nm		ps/km · nm	≤ 3.7
• at 1550 nm		ps/km · nm	≤ 18.5
• at 1625 nm		ps/km · nm	≤ 23.0
Zero Dispersion Wavelength, λ_0		nm	1300 - 1324
Zero Dispersion Slope		ps/(nm ² · 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
10 turns on a mandrel R = 15 mm at 1550 nm	IEC/EN 60793-1-47	dB	≤ 0.03
10 turns on a mandrel R = 15 mm at 1625 nm	IEC/EN 60793-1-47	dB	≤ 0.1
1 turn on a mandrel R = 10 mm at 1550 nm	IEC/EN 60793-1-47	dB	≤ 0.1
1 turn on a mandrel R = 10 mm at 1625 nm	IEC/EN 60793-1-47	dB	≤ 0.2
1 turn on a mandrel R = 7.5 mm at 1550 nm	IEC/EN 60793-1-47	dB	≤ 0.5
1 turn on a mandrel R = 7.5 mm at 1625 nm	IEC/EN 60793-1-47	dB	≤ 1.0

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	-	1.467
1625 nm	IEC/EN 60793-1-22	-	1.468

RAYLEIGH BACKSCATTER COEFFICIENT (INS PULSE WIDTH)

Attribute	Measurement method	Units	Limits
1310 nm	-	dB	-79.1
1550 nm	-	dB	-81.4
1625 nm	-	dB	-82.2

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 - ColorLock® XS and Natural	IEC/EN 60793-1-21	µm	245 ± 10
Coating non-Circularity	IEC/EN 60793-1-21	%	≤ 5
Coating-Cladding Concentricity error	IEC/EN 60793-1-21	µm	≤ 12

MECHANICAL PROPERTIES

Attribute	Measurement method	Units	Limits
Proof stress level	IEC/EN 60793-1-30	GPa	≥ 0.7 (≈ 1 %)
Strip force (peak)	IEC/EN 60793-1-32	N	1.2 ≤ F _{peak,strip} ≤ 8.9
Dynamic Fatigue Resistance, aged and unaged	IEC/EN 60793-1-33	-	n _d ≥ 20

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Properties of BendBright™ XS 200µm Single-Mode Fibre

Flextube SM_G.657.A2 BBXS 200µm (C35)



APPLICABLE STANDARDS

- IEC / EN 60793-2-50 Category B-657.A2 and B-652.D
- ITU Recommendation G.657.A2 and G.657.B2
- ITU-T Recommendation G.652.D
- EN 50 173-1: Category OS2 and OS1a
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Maximum attenuation in cable at 1383 nm ⁽¹⁾	IEC/EN 60793-1-40	dB/km	≤ 0.38
Maximum attenuation in cable at 1550 nm	IEC/EN 60793-1-40	dB/km	≤ 0.23
Maximum attenuation in cable at 1625 nm	IEC/EN 60793-1-40	dB/km	≤ 0.25
Local discontinuity at 1310 and 1550 nm	IEC/EN 60793-1-40	dB	max. 0.1

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

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Mode field diameter at 1550 nm	IEC/EN 60793-1-45	µm	9.8 ± 0.5
Chromatic Dispersion coefficient:	IEC/EN 60793-1-42		
• in the interval 1285 nm – 1330 nm		ps/km · nm	≤ 3.7
• at 1550 nm		ps/km · nm	≤ 18.5
• at 1625 nm		ps/km · nm	≤ 23.0
Zero Dispersion Wavelength, λ_0		nm	1300 - 1324
Zero Dispersion Slope		ps/(nm ² · 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⁾

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10 turns on a mandrel R = 15 mm at 1625 nm	IEC/EN 60793-1-47	dB	≤ 0.1
1 turn on a mandrel R = 10 mm at 1550 nm	IEC/EN 60793-1-47	dB	≤ 0.1
1 turn on a mandrel R = 10 mm at 1625 nm	IEC/EN 60793-1-47	dB	≤ 0.2
1 turn on a mandrel R = 7.5 mm at 1550 nm	IEC/EN 60793-1-47	dB	≤ 0.5
1 turn on a mandrel R = 7.5 mm at 1625 nm	IEC/EN 60793-1-47	dB	≤ 1.0

GROUP INDEX OF REFRACTION

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1625 nm	IEC/EN 60793-1-22	-	1.468

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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 - ColorLock® XS and Natural	IEC/EN 60793-1-21	µm	200 ± 10
Coating non-Circularity	IEC/EN 60793-1-21	%	≤ 5
Coating-Cladding Concentricity error	IEC/EN 60793-1-21	µm	≤ 10

MECHANICAL PROPERTIES

Attribute	Measurement method	Units	Limits
Proof stress level	IEC/EN 60793-1-30	GPa	≥ 0.7 (≈ 1 %)
Strip force (peak)	IEC/EN 60793-1-32	N	1.0 ≤ F _{peak,strip} ≤ 8.9
Dynamic Fatigue Resistance, aged and unaged	IEC/EN 60793-1-33	-	n _d ≥ 20

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