Fiberkabel 96x9/125 LSZH gul inden/udendørs LAN-OPTIC OS2

Anvendelse

Anvendes i datainstallationer som backbone eller ved lange afstande, hvor der ønkes stor båndbrede. Kablet kan anvendes inde/udendørs. Skal føres i rør ved udendørs installationer.

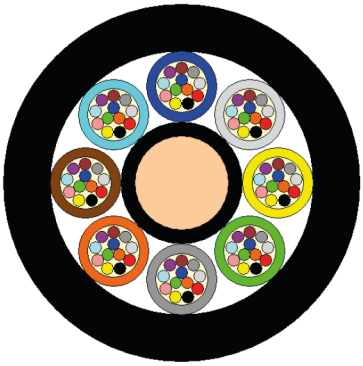
Varenr.: 232556

Specifikation

Konstruktion: Loose tube
Antal fiber: 96
Fiberstørrelse: 9 my
IOR, 1310nm: 1.467
IOE, 1550nm: 1.468
IOE, 1625nm: 1.468
Kappe: LSZH
Trækstyrke: 1000 N
Standard: G657A1
CRR: ECa
Oplægning: Tromle 4000mtr

Cable Design

IEC/EN 60794



96 fo cable- not to scale -

- **Central Strength Member (CSM):** glass fibre reinforced plastic rod (FRP) with plastic oversheathing.
- **Loose Tube:** thermoplastic material, containing up to 12 fibres and filled with a suitable water tightness compound.
- **Filler Elements:** thermoplastic rods, where needed.
- **Stranding:** loose tubes (and fillers), SZ stranded around the CSM. A white-red identification thread is laid into the optical core
- **Longitudinal Water Tightness:** dry core with water swellable elements.
- **1 Ripcord.**
- **Outer Sheath:** HFFR.

Technical data

No. of Fibres		**96**		
Design		8 x 12		
Loose Tube / Filler - Ø	mm	1.5		
CSM – Ø	mm	2.0		
CSM-Oversheathing - Ø	mm	2.6		
Outer Sheath Thickness	mm	1.0		
Cable Diameter	mm	8.2 (max)		
Cable Weight	kg/km	60		
Max. Installation Tension	N	1000		
Minimum Bending Radius	mm	Without Tension 10 x Cable-Ø		Under Maximum Tension 20 x Cable-Ø
Temperature Range	ºC	Installation - 30 to + 60	Transport & Storage - 40 to + 70	Operation - 40 to + 70

Please refer to our General Installation, Safety & Handling recommendations before handling.

Main characteristics

Test	**Test Standard**	**Specified Value**	**Acceptance Criteria**
Max. Installation Tension	IEC 60794–1–2-E1	See configuration table	$\Delta\alpha$ reversible, fibre strain $\leq$ 0.5%
Max. Operation Tension	IEC 60794–1–2-E1	130 N	no fibre strain, $\Delta\alpha \leq$ 0.05 dB
Crush	IEC 60794–1–2-E3	350 N / 100 mm, max. 15 min	$\Delta\alpha \leq$ 0.05 dB, no damage
Impact	IEC 60794–1–2-E4	2 Nm, 3 impacts, R= 300 mm	$\Delta\alpha \leq$ 0.05 dB after the test
Torsion	IEC 60794–1–2-E7	100N, +/- 180°, 5 cycles, 2 m	$\Delta\alpha \leq$ 0.05 dB after the test,no damage
Cable Bend	IEC 60794–1–2-E11	R=10x D, 4 turns, 3 cycles	$\Delta\alpha \leq$ 0.05 dB, no damage
Temperature Cycling	IEC 60794–1–2-F1	-15°C to +60°C -30°C to +70°C -40°C to +70°C	$\Delta\alpha \leq$ 0.05 dB/km $\Delta\alpha \leq$ 0.10 dB/km $\Delta\alpha \leq$ 0.15 dB/km
Water Penetration	IEC 60794–1–2-F5B	sample=3m, water column=1m	no water leakage in 24h

All optical measurements at 1550 nm. Acceptance criteria for MM fibres ≤ 0.2 dB for all mechanical test and ≤ 0.5 dB/km for temperature cycling, instead of 0.05 dB (SM).

Optical Characteristics

See the attached cabled optical fibre data sheet.

Fire Performance

Test	Test Standard	Specified Value	Acceptance Criteria
Single Cable Test	IEC 60332-1	unburnt cable length	> 50 mm
Halogen Content	IEC 60754-1	halogen content	< 0.5 %
Corrosivity of Smoke Gases	IEC 60754-2	pH-value	≥ 4.3
Conductivity of Smoke Gases	IEC 60754-2	conductivity	> 10 µS

Identification

Fibre Colours

No.	1	2	3	4	5	6	7	8	9	10	11	12
Colour	red	green	blue	yellow	white	grey	brown	violet	turquoise	black	orange	pink

Buffer Tube Colours

No.	1	2	3	4	5	6	7	8
Colour	red	green	blue	yellow	white	grey	brown	violet

Filler Elements Colours:
All filler elements are uncoloured (natural).

Sheath Colour:
The outer sheath colour is yellow

Sheath Marking:
The outer sheath is marked in 1 meter intervals as follows:Fiberoptic indoor/outdoor LSZH jacket 96xG657A1 Lan-Optic

Logistic

Packing:
Plywood drums with protection.

Delivery Lengths:
Standard delivery lengths are 4 km with a tolerance of -1% / +3%

LANOPTIC

Properties of cable with standard BendBright® fibre

ESMF, low water peak G652D, OS2, G657A1 low bend, FTTx

General and application

The optical fibres are made of a high grade doped silica core surrounded by a silica cladding;

They are coated with a dual layer, UV cured acrylate based coating.

This enhanced low macro bending sensitive, low water peak fibre, gives very good bending performance. This BendBright® fibre is suitable for all applications (access networks as well as general transport networks). The BendBright® offers reduced bending radii for many cables types. The fibre fulfils the latest ITU G.657 A1 specification, as well as G.652.D. The low macro bending sensitivity further guarantees that the 1625 nm window (L-band) will be available for future use in this bandwidth hungry environment

Standards and Norms

IEC 60793-2-50 Category B.1.3 and B6_a1	ANSI/ICEA S-87-640
ITU Recommendation G.657.A1	EN 50 173-1: cat. OS2 and OS1
ITU Recommendation G.652 A, B, C and D	ISO/IEC 11801: cat. OS1
Telcordia GR-20-CORE	ISO/IEC 24702: cat. OS2 and OS1
	IEEE 802.3

Optical properties

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		µm	10.1 ± 0.5
Chromatic dispersion coefficient:	IEC/EN 60793-1-42		
In the interval 1285 nm – 1330 nm		ps/km • nm	≤ |3|
At 1550 nm		ps/km • nm	≤ 18.0
At 1625 nm		ps/km • nm	≤ 22.0
Zero dispersion wavelength, λ_0		nm	1300 - 1322
Zero dispersion slope		ps/(nm^2 • km)	≤ 0.092
Cut-off wavelength	IEC/EN 60793-1-44	λ_{cc} nm	≤ 1260 *
Polarisation mode dispersion (PMD) coefficient	IEC/EN 60793-1-48	ps/√km	≤ 0.1
PMD_Q Link Design Value (computed with Q=0.01%, N=20)	IEC/EN 60794-3	ps/√km	≤ 0.06

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

Attenuation

Attribute	Measurement method	Units	Limits
Maximum attenuation value of cable in the interval 1310 nm – 1625 nm*	IEC/EN 60793-1-40	dB/km	≤ 0.39
Maximum attenuation value of cable at 1550 nm	IEC/EN 60793-1-40	dB/km	≤ 0.22
Local discontinuity at 1310 and 1550 nm	IEC/EN 60793-1-40	dB	max. 0.1

** Including H2-ageing according to IEC 60793-2-50, type B.1.3, @1383nm*

Attenuation variation vs Bending

Attribute	Measurement method	Units	Limits
100 turns on a mandrel R = 25 mm, @1310 & 1550nm	IEC/EN 60793-1-47	dB	≤ 0.02
100 turns on a mandrel R = 30 mm, @1625nm	IEC/EN 60793-1-47	dB	≤ 0.05
10 turns on a mandrel R = 15 mm, @1550nm	IEC/EN 60793-1-47	dB	≤ 0.25
10 turns on a mandrel R = 15 mm, @1625nm	IEC/EN 60793-1-47	dB	≤ 1.0
1 turn on a mandrel R = 10 mm, @1550nm	IEC/EN 60793-1-47	dB	≤ 0.75
1 turn on a mandrel R = 10 mm, @1625nm	IEC/EN 60793-1-47	dB	≤ 1.5

LAN-OPTIC

Group index of refraction

Attribute	Measurement method	Units	Values
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 (1ns pulse width)

Attribute	Measurement method	Units	Values
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 (MDF) -cladding concentricity error	IEC/EN 60793-1-20	µm	≤ 0.5
Primary coating diameter – ColorLock$_{®}^{XS}$ and natural	IEC/EN 60793-1-21	µm	242 ± 7
Primary coating non-circularity	IEC/EN 60793-1-21	%	≤ 5
Primary 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
Static fatigue, aged	IEC / EN 60793-1-33	(N_s)	≥ 23

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