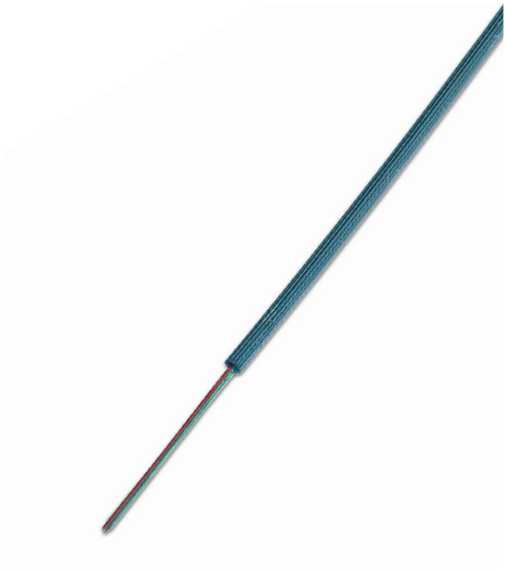
LIGHTWIN® MICRO DUCT CABLE FOR INSTALLATION BY BLOWING

LMCC 4 A1 1X4 HDPE

DESCRIPTION

Lightwin® micro cable 4-fiber, singlemode G.657.A1,
Sheath material: HDPE (High Density Polyethylene),
Fiber: Singlemode, bend insensitive G.657A1 fiber,
Bundling: 1x4,
Outer diameter: 2,3mm,
suitable for blowing into micro-pipe systems



Note: Colour code of tubes following colour table in this datasheet

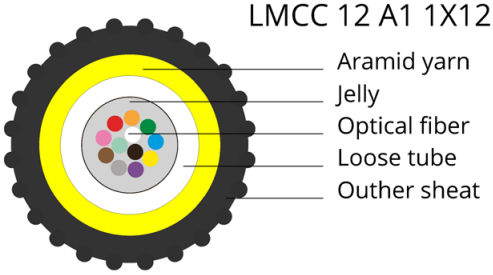
OPTIC CABLE GENERAL DESIGN

Optical fibers are housed in central loose tube that is made of high-modulus plastic and filled with waterproof compounds.
Aramid yarn as strength member.
Polyethylene sheath is applied over the cable core.

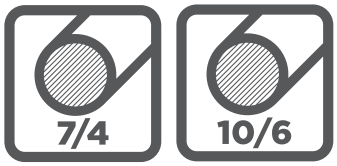
CONSTRUCTION

Cross Section of Cable

LMCC 12 A1 1X12 HDPE



SUITABLE FOR FOLLOWING MICRODUCT DIAMETERS



DIMENSIONS AND DESCRIPTIONS OF CABLE CONSTRUCTIONS

Item	contents	Wert					
Fiber	number	2	4	6	8	12	24
	Loose tube	diameter(mm)					1.8±0.2
Outer sheath	Material	HDPE					
	Color	Black					
	Thickness(mm)	Approx.0.2					
Cable diameter(mm) Approx.		2.3±0.2					2.6±0.2
Cable weight(kg/km) Approx.		3.5±1.0					5±1.0

EAN number	9120042366634
Packaging	Disposable wooden drum
Weight	See data sheet

PART NUMBER

LMCC 4 A1 1X4 HDPE

LIGHTWIN® MICRO DUCT CABLE FOR INSTALLATION BY BLOWING

LMCC 12 A1 1X12 HDPE

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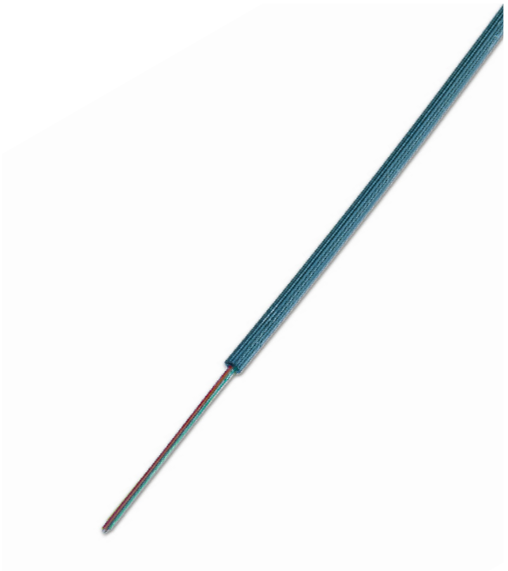
Lightwin® micro cable 4-fiber, singlemode G.657.A1,
Sheath material: HDPE (High Density Polyethylene),
Fiber: Singlemode, bend insensitive G.657A1 fiber,
Bundling: 1x4,
Outer diameter: 2,3mm,
suitable for blowing into micro-pipe systems



Note: Colour code of tubes following colour table in this datasheet

OPTIC CABLE GENERAL DESIGN

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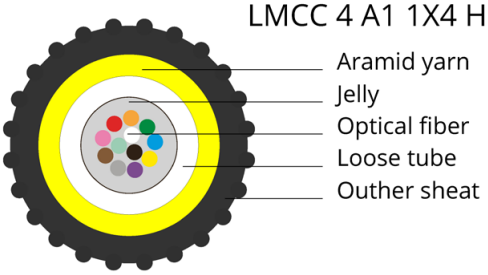
Aramid yarn as strength member.
Polyethylene sheath is applied over the cable core.

CONSTRUCTION

Cross Section of Cable

LMCC 4 A1 1X4 HDPE



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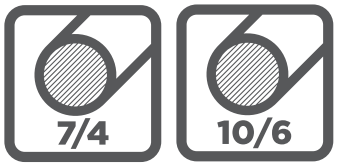


DIMENSIONS AND DESCRIPTIONS OF CABLE CONSTRUCTIONS

Item	contents	Wert					
Fiber	number	2	4	6	8	12	24
	Loose tube	diameter(mm)					1.8±0.2
Outer sheath	Material	HDPE					
	Color	Black					
	Thickness(mm)	Approx.0.2					
Cable diameter(mm) Approx.		2.3±0.2					2.6±0.2
Cable weight(kg/km) Approx.		3.5±1.0					5±1.0

EAN number	9120042366726
Packaging	Disposable wooden drum
Weight	See data sheet

PART NUMBER

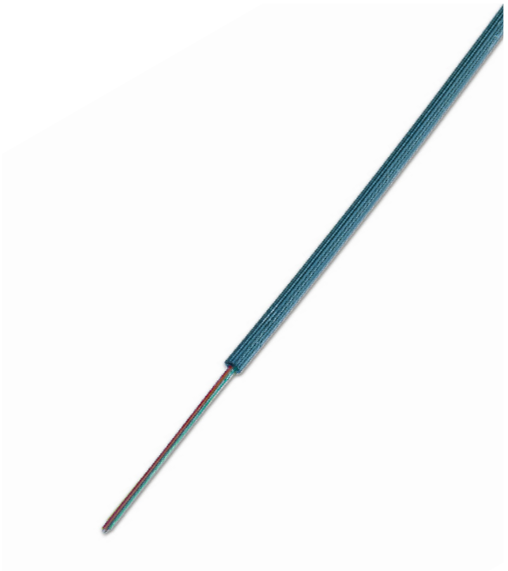
LMCC 12 A1 1X12 HDPE

LIGHTWIN® MICRO DUCT CABLE FOR INSTALLATION BY BLOWING

LMCC 24 A1 1X24 HDPE

DESCRIPTION

Lightwin® 24-fiber micro cable,
Singlemode G.657.A1,
Sheath material: HDPE (High Density Polyethylene),
Fiber: Singlemode,
G.657A1 fiber insensitive to bending,
Bundling: 1x24,
Outer diameter: 2,6mm,
suitable for blowing into micro-pipe systems



Note: Colour code of tubes following colour table in this datasheet

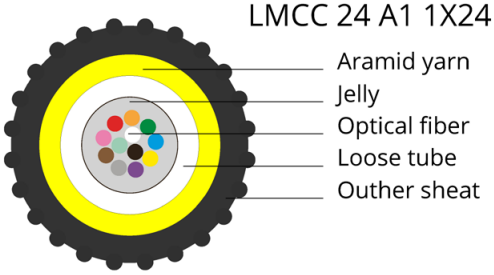
OPTIC CABLE GENERAL DESIGN

Optical fibers are housed in central loose tube that is made of high-modulus plastic and filled with waterproof compounds.
Aramid yarn as strength member.
Polyethylene sheath is applied over the cable core.

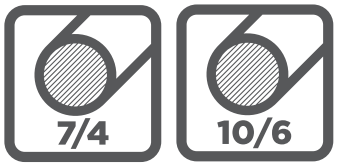
CONSTRUCTION

Cross Section of Cable

LMCC 24 A1 1X24 HDPE



SUITABLE FOR FOLLOWING MICRODUCT DIAMETERS



DIMENSIONS AND DESCRIPTIONS OF CABLE CONSTRUCTIONS

Item	contents	Wert					
Fiber	number	2	4	6	8	12	24
	Loose tube	diameter(mm)					1.8±0.2
Outer sheath	Material	HDPE					
	Color	Black					
	Thickness(mm)	Approx.0.2					
Cable diameter(mm) Approx.		2.3±0.2					2.6±0.2
Cable weight(kg/km) Approx.		3.5±1.0					5±1.0

EAN number	9120042366733
Packaging	Disposable wooden drum
Weight	See data sheet

PART NUMBER

LMCC 24 A1 1X24 HDPE

LIGHTWIN® MICRO DUCT CABLE FOR INSTALLATION BY BLOWING LMCC xx A1 1Xxx HDPE

GENERAL

This specification covers the design and performance of the single mode optical cables to be used in air blown micro duct application.

CABLE DESCRIPTION

- 2/4/6/8/12/24 G657A1 SM-fibers.
- Central tube structure.
- Suitable for air blown cable in micro-duct installation.

QUALITY

Lightwin® ensures a continuing level of quality in our cable products through several programs including ISO 9001.

RELIABILITY

Lightwin® ensures product reliability through rigorous qualification testing of each product family. Both initial and periodic qualification testing are performed to assure the cable's performance and durability in the field environment.

REFERENCE

ITU-T G.657A1	Characteristics of a single-mode optical fiber
IEC 60794-1-1	Optical fiber cables- part1-1-Generic specification-General
IEC 60794-1-2	Optical fiber cables- part1-2-Generic specification-Basic optical cable test procedure
IEC 60794-3	Optical fiber cables- part3-Sectional specification- Outdoor cables
IEC 60794-5	Optical fiber cables- part5-Sectional specification- Microduct cabling for installation by blowing

WORKING CONDITION

Transportation and storage temperature	-20°C~+70°C
Installation temperature	-5°C~+50°C
Operation temperature	-20°C~+70°C

MINIMUM ALLOWABLE BENDING RADIUS

Static	10D (D is the outer diameter of the cable)
Dynamic	20D (D is the outer diameter of the cable)

LIFE TIME

Optical fiber cables supplied in compliance with the specifications can be capable of withstanding the typical service condition for a period of twenty-five (25) years without detriment to the transmission or operation and maintenance characteristics of the cable.

MECHANICAL PERFORMANCE OF CABLE

Tensile performance(N)		Crush(N/100mm)	
Short term	Long term	Short term	Long term
1.0G	0.15G	200	100

G is the weight of cable per kilometer, the unit is Newton (N).

LIGHTWIN® MICRO DUCT CABLE FOR INSTALLATION BY BLOWING — LMCC xx A1 1Xxx HDPE

OPTICAL FIBER IN CABLE(ITU-G657A1)

Optical properties of the SM fiber are achieved through a germanium doped silica based core with a pure silica cladding which meets ITU-T G652D, UV curable acrylate protective coating is applied over the glass cladding to provide the necessary maximum fiber lifetime.

GEOMETRICAL, OPTICAL, AND MECHANICAL CHARACTERISTICS OF FIBER IN CABLE AS THE FOLLOWING TABLE

Category	Description	Specification	
		Before cable	After cable
Geometrische Eigenschaften	Cladding diameter	125.0 ± 1 μm	
	Cladding non-circularity	≤ 1.0 %	
	Core concentricity error	≤ 0.6μm	
	Coating diameter	245± 10 μm (Before Colored) 250 ± 15 μm (Colored)	
	Coating/cladding concentricity error	≤ 12μm	
Optische Eigenschaften	Mode field diameter at 1310 nm	8.8 ± 0.4 μm	
	Point discontinuity	≤ 0.34 dB/km	≤ 0.35 dB/km
	Attenuation at 1310 nm	≤ 0.34 dB/km	≤ 0.35 dB/km
	Attenuation at 1383 nm	≤ 0.21 dB/km	≤ 0.22 dB/km
	Attenuation at 1550 nm	≤ 0.23 dB/km	≤ 0.24 dB/km
	Attenuation at 1625 nm	≤ 3.5 ps/(nm·km)	
	Dispersion in 1288 – 1339 nm	≤ 5.3 ps/(nm·km)	
	Dispersion in 1271 – 1360 nm	≤ 18 ps/(nm·km)	
	Dispersion at 1550 nm	1300 – 1324 nm	
	Zero dispersion wavelength	≤ 0.092 ps/(nm^2·km)	
	Zero dispersion slope	≤ 1260 nm	
	Cable cut-off wavelength	≤ 0.2 ps/√km	
	Polarization mode dispersion individual fiber	≤ 0.1 ps/√km	
	Polarization mode dispersion design link value (M=20, Q=0.01%) Macro-bend loss (1turns, 10mm radius, 1550um)	≤ 0.1 dB	
Mechanical Specification	Proof stress level	≤ 100kpsi (0.69 GPa)	
	Coating strip force(peak value)	1.3~8.9N	
	Fiber curl (Radius)	≥ 4 m	

COLOR CODE OF THE FIBER

Each fiber can be identifiable throughout the length of the cable in accordance with the following color sequence. Fiber color in each tube starts from No. 1 Red.

Fiber Color Code

No.	1	2	3	4	5	6	7	8	9	10	11	12
Color	Red	Green	Blue	Yellow	White	Grey	Brown	Violet	Aqua	Black	Orange	Pink
No.	13	14	15	16	17	18	19	20	21	22	23	24
Color	Red	Green	Blue	Yellow	White	Grey	Brown	Violet	Aqua	Natural	Orange	Pink

Ring marks width 2±1.5mm，Color ring intervals 60±10mm。

LIGHTWIN® MICRO DUCT CABLE FOR INSTALLATION BY BLOWING LMCC xx A1 1Xxx HDPE

MECHANICAL, ELECTRICAL AND ENVIRONMENTAL TEST CHARACTERISTICS

The finished cables can be subjected to the following mechanical, electrical and environmental conditions.

Item	Test Method	Requirements
Tensile performance	IEC 60794-1-2-E1 Load: 1.0G Cable length under tension: Not less than 50m. Duration of load sustain: 1min. Velocity of transfer device: 10mm/min	The maximum increase in attenuation less than 0.1 dB . The maximum fiber strain less than 0.6% under maximum tensile short term load. No change in attenuation after test at 1550nm. Under visual examination without magnification, no damage to the sheath or to the cable elements after test.
Crush	IEC 60794-1-2-E3 Load: 200N Duration of load: 1min	No change in attenuation after test at 1550nm. Under visual examination without magnification, no damage to the sheath or to the cable elements. The imprint of the striking surface on the sheath is not considered mechanical damage
Bend	IEC 60794-1-2-E11A Mandrel radius: 10 times cable diameter Turns:10 Cycles:5	No change in attenuation at 1550nm after test. Under visual examination without magnification, no damage to the sheath or to the cable elements.
Repeated bending	IEC 60794-1-2-E6 Bending radius: 20 times cable diameter Cycles: 25 Load: 25N Duration of cycle: Approximately 2s.	No change in attenuation at 1550nm after test. Under visual examination without magnification, no damage to the sheath or to the cable elements.
Torsion	IEC 60794-1-2-E7 Cycles:5 Length under test: 1m Turns: ±180° Load: 0.5G*W	The variation on attenuation for each fiber less than 0.1dB at 1550nm Under visual examination without magnification, no damage to the sheath or to the cable elements. No permanent change in attenuation after test
Temperature cycling	IEC 60794-1-2-F1 Sample length: at least 1000m Temperature range: -20ºC+70ºC Cycles: 2 Temperature cycling test dwell time: 12 hours	No change in attenuation coefficient at 1550nm after test.
Water Penetration	IEC 60794-1-2-F5B Time : 24 hours Sample length : 3m Water height : 1m	No water leakage
Compound flow	IEC 60794-1-2-E14 Sample count:5 Sample length:300 ±5 mm, Remove length: 130 ±2,5 mm, Time:24h	No filling compound dripped.
Jetting Performance	Conform to IEC 60794-5-10	
Other parameters	Conform to IEC 60794	

Remark: “No attenuation changes” is considered as the attenuation changes ≤ 0.05 dB.

LIGHTWIN® MICRO DUCT CABLE FOR INSTALLATION BY BLOWING LMCC xx A1 1Xxx HDPE

CABLE SHEATH MARKING

Unless otherwise specified, the cable sheath marking shall be as follows:
Color: white
Contents: manufacture name, the year of manufacture, the type of cable, length marking
Interval: 1m

PACKAGING AND SHIPPING

Reel Length	Standard reel length: 4/ km/reel 2km possible on request
Cable Drum	The cables are packed in wooden drums The minimum barrel diameter of the drum shall be more than 30 times of the nominal diameter for armored cable, and 25 times of the nominal diameter for unarmored cable.
Labeling	The direction of rotation of the color scheme is shown by marking the clockwise and anti-clockwise ends with red and green adhesive tape respectively. The markings are on both sides of the flanges as follows: • Cable Type/Size • Cable Length • Gross Weight. • EXAMPLE: LIGHTWIN - LMCC 4x SM G.657.A1 (1x4) 250µm HDPE COATING {Batch} {Length} • Shipping mark.
Cable Packing	Both cable ends are provided with protections against water penetration and firmly secured to the drum, so the cable cannot move and the turns cannot slide when it is moved, handled or laid. the inner end has at least 3 meters of accessible length to perform reception tests in the cables.