

DISCOVER YOUR

CABLE CATALOGUE

Telenco networks' cables are, in general, dedicated to the direct or indirect connectivity of users of high-speed broadband networks, fixed or mobile, public or private.

Technically, these cable categories cover all cables less than 6.0mm in diameter and containing a maximum of 24 fibres (with some exceptions).

Telenco networks' drop cables offer consists of three product families:

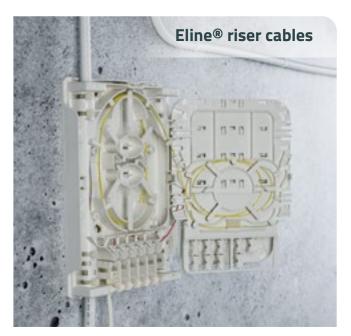






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Robust fibre optic cables and designed for future-proof FTTH and FTTA networks

Thanks to its historical position in the FTTH market, the Telenco Group has developed extensive knowledge of cables, on the one hand through the development of a wide range of wedge clamps or spiral devices for overhead cables, and on the other hand, through the design and manufacture of drop cables for FTTH connections to all premises. This gives Telenco strong skills and expertise in the design, production, packaging and delivery of cables in drums, reels or integrated in pre-connected solutions. Flexible and proficient in all cable technologies, Telenco can also adapt its cable designs to your specific needs.

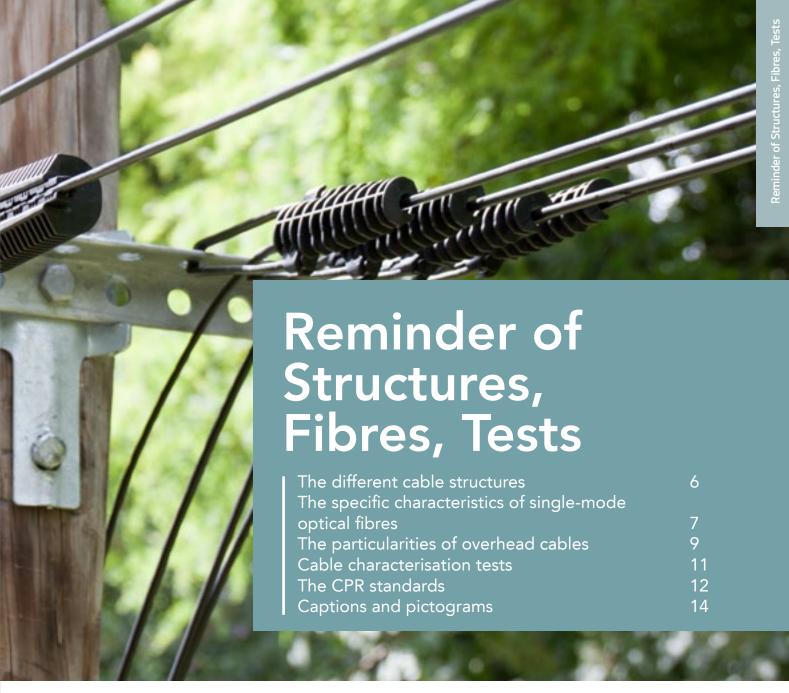
The purpose of this catalogue is to present the Telenco Group's cable portfolio. Whatever your needs, you will find in Telenco's cable offer solutions for all types of FTTx connections and installation techniques:

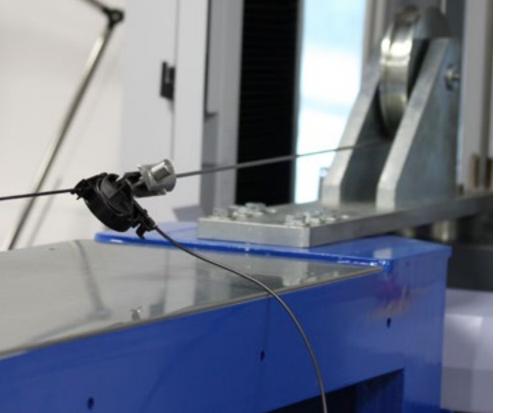
- Inside buildings: pulling, pushing, gluing, stapling
- Outside: duct, façade, overhead

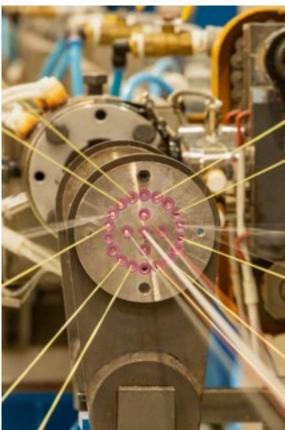
Aware that infrastructures are being built today for decades to come, the Telenco Group:

- Is committed to providing the highest quality products
- Always refers to international cable standards
- Chooses the best raw materials and as much as possible locally
- Takes into account all environmental aspects through product life cycle analysis in order to reduce the overall ecological footprint of its products and packaging

Let's develop tomorrow's sustainable and reliable networks, today!







REMINDER OF STRUCTURES, FIBRES, TESTS

The different cable structures

Drop, Droptic® and Eline® cables

In the Telenco Group, the notion of drop cable is broader than just the family of drop cables for FTTH applications. Indeed, a drop cable meets very specific criteria in terms of size and number of fibres. Its primary function is to connect subscribers to an optical distribution network at very high speed, whatever the conditions.

Thus, the Droptic® family of cables now includes a large number of different technical solutions for making these connections of any kind:

- Overhead, underground, façade
- Indoor, outdoor or both
- Pullable, pushable, stapleable, glueable, blowable

And meeting the technical criteria:

- Ø ≤ 6mm
- Number of optical fibres ≤ 24

The Eline® family of cables consists mainly of multi-fibre distribution cables, and is associated with the distribution of the optical network in buildings or on building façades. It includes indoor or indoor/outdoor cables that enable to extract the fibres from the cable to connect a dwelling. This cable family is an integral part of Telenco's Eline® range, which includes building entry points, floor boxes and splice boxes.

The different cable technologies

Several cable technologies form the technical basis of the Droptic® range. They are highlighted in the designation of the cables and respond to the challenges of using the cables depending on the application, the network architecture and the installation method. There are 4 cable technologies, all of which are mastered by Telenco.



The module technology used for each cable is known immediatly as it is identified in the cable designation.

LIVI

Micro-module structure

Droptic® LM families are built on the basis of micromodules made of LSZH-FR material, with diameters ranging from 0.9 to 1.6mm, which can contain up to 24 optical fibres. These micro-modules are finger tearable and do not contain any sealing jelly to facilitate access to the fibres and their preparation for fusion.

As soon as they are manufactured, 100% of the modules are tested for strippability, i.e. stripping 1 metre in a maximum of 1 minute depending on the number of fibres.



Tight or semi-tight buffer



Droptic® LX cables are cables made up of tight or semitight modules with 1 fibre of 900 μ m diameter. These solutions allow the storage of fibres or buffers in the interconnection boxes directly in junction boxes. In addition, this technology is also used in combination with field-mountable connectors (FMC), directly on the 900 μ m.

These modules with tight or semi-tight fibres are 100% tested for strippability at the time of manufacture, based on stripped length criteria in a single clamp operation.

LC

Central loose tube structure

The LC families are central-tube cable families with a diameter of up to 2.5mm. The central tube can contain up to 24 fibres depending on its size. Around this tube are deployed the reinforcement elements and the cable protection sheaths. Either sealing jelly or swelling ropes are used for waterproofing the structure.

By construction, LC cables are slightly stiffer than LM drop cables.



Central microloose tube structure

Similar to the LC family, the LS family is distinguished by tubes with a maximum diameter of 1.6 mm. LS structures are therefore small cables that are suitable for blowing into microtubes with internal diameters of 3.5mm to 6 mm.





The specific characteristics of single-mode optical fibres

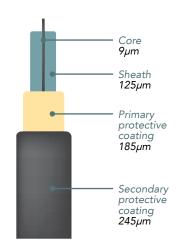
Droptic® cables are mainly cables with single-mode optical fibres.

These fibres are composed of:

- A glass optical guide of $125\mu m$ diameter at the centre of which is the optical core of approximately $9\mu m$ diameter constituting the part in which the light propagates.
- A primary and secondary protective coating to protect the fibre mechanically, to enable it to be handled and to identify it thanks to a thin coloured layer or a colouring in the mass of the secondary coating.

The propagation of light within the core takes place by successive reflection at the core/sheath interface. Several light rays propagate through the core.

With a step-index profile and a small core diameter, only one light ray propagates: the fibre is said to be single mode.

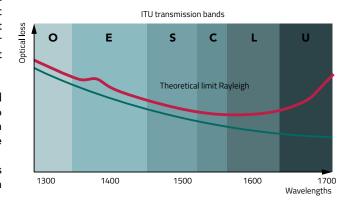


Bandwidth

For long-distance telecommunications and data transport applications, the optical spectrum or wavelength band that can be used (see graph opposite) is in the near infrared (light that cannot be seen with the naked eye) and extends over the range 1260 - 1675nm. The bandwidth is then almost infinite (> 60THz).

In order to facilitate its exploitation, the bandwidth is subdivided into optical bands. Initially used in the O-band (Original) due to the availability of optical sources, optical fibre was soon used in the L-band due to its low line attenuation. Today, for data rate purposes, all bands are used by PON technologies.

Therefore, all cables defined by Telenco are controlled as standard at 1310nm, 1550nm and 1625nm, to guarantee use in all wavelength bands.



Fibre specifications

The International Telecommunication Union (ITU) has issued a series of ITU-T recommendations G.652D, G.657A1, G.657A2, G.657B3 on the specifications of the different categories of single-mode fibres in cables and the associated characterisation methods.

The International Electrotechnical Commission (IEC) has published a series of standards IEC 60793-1-50 describing the technical specifications for measurement and testing of Category B optical fibres. These standards supplement the ITU recommendations by adding performance in terms of the mechanical and environmental resistance of the fibre.

Equivalent in terms of optical properties, the different categories of fibre differ in their:

- Bending performance
- Splicing compatibility with G.652D fibres

Soldering compatibility

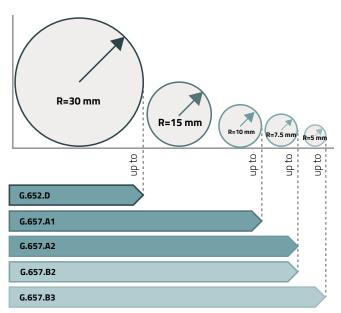
Soldering compatibility is ensured when the diameters of the mode fields of the fibres to be soldered are close. In this case, there is full compatibility between G.652D, G.657A1 and G.657A2 fibres. The mode field diameter is the diameter in which at least 99% of the transmitted light power is contained.

The adjacent table shows the different normative ranges of mode field diameter depending on the type of fibre.

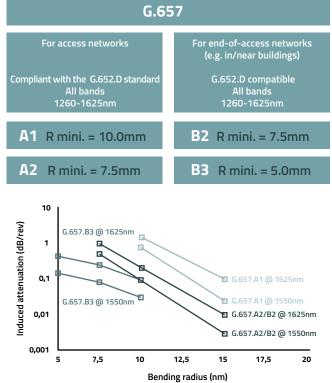
As a result, Telenco has chosen to deploy ITU-T G.657A2 and G.657B3 compliant fibres whose mode field diameter remains compatible with that of the G.652D fibre, i.e. in the 8.6 - 9.5 μm range.

ITU	Designation	MDF ₁₃₁₀ En μm
G.652D	Non-dispersion shifted fibre, optimised at 1383 nm without OH peak with low PMD	8.6 - 9.5 (+/-0.6)
G.657A1		8.6 - 9.5 (+/-0.4)
G.657A2	Single-mode optical fibres insensitive to bending losses	0.0 - 7.3 (+7-0.4)
G.657B2	for access networks	6.3 - 9.5 (+/-0.4)
G.657B3		0.3 - 7.3 (+/-0.4)

Bending performance



The macro-bending performance of the fibre subcategories of recommendation G.657 compared to the fibre G.652D



Fibre identification

To differentiate fibres and modules in cables, there is a colour code based on 12 different colours.

This distinction must still be effective after a few years of use of the fibres and cables.

When designing the products, Telenco systematically performs ageing tests on the cables to ensure that there is no degradation of the colours and that the fibres are still identifiable.

The order of the colours differs according to the standards.

EIA598-	A colour code	DIN VDE 0888 colour code		IEC 60794-2 colour code		AFNOR XPC	93-850 colour code
Position of the fibre	Colour	Position of the fibre	Colour	Position of the fibre	Colour	Position of the fibre	Colour
1	Blue	1	Red	1	Blue	1	Red
2	Orange	2	Green	2	Yellow	2	Blue
3	Green	3	Blue	3	Red	3	Green
4	Brown	4	Yellow	4	White	4	Yel-low
5		5	White	5	Green	5	Pur-ple
6	White	6	Grey	6	Purple	6	White
7	Red	7	Brown	7	Orange	7	Orange
8	Black	8	Purple	8		8	Grey
9	Yellow	9	Turquoise	9	Turquoise	9	Brown
10	Purple	10	Black	10	Black	10	Black
11		11	Orange	11	Brown	11	Turquoise
12	Turquoise	12	Pink	12	Pink	12	Pink

As standard, Telenco uses the AFNOR XPC 93-850 or DIN VDE 0888 colour code. However, we can work with you on all your fibre and cable identification needs.

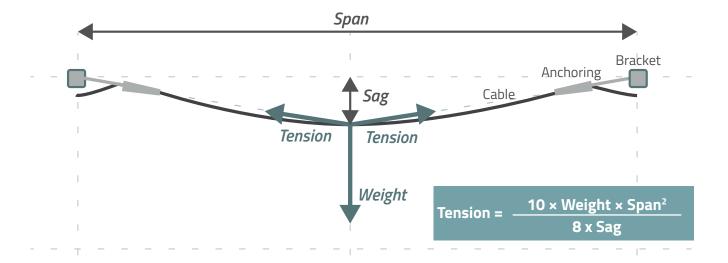
The particularities of overhead cables

The dimensioning of overhead drop cables and their anchoring compatibility

Sizing an overhead cables is a complex operation to establish the tensile performance of the cable taking into account the installation parameters between two poles and environmental parameters such as temperature, wind, ice.

The maximum permissible tightness, which must be higher than the tension induced on the cable under extreme conditions, is determined depending on the amount of cover present in the cable. Without taking into account the climatic conditions, the calculated tension is the installation tightness.

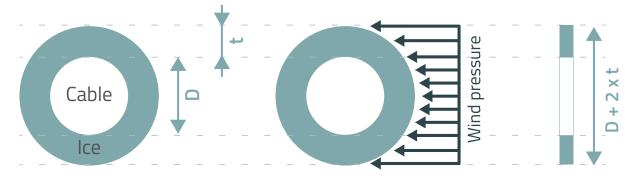
The tension on the cable is calculated as follows:



Weight (kg/m): apparent weight of 1 metre of cable Tension (N): calculated tension on the cable

Span (m): distance between two pole Sag (m): vertical distance to the centre of the span, usually 1% of the span

Taking into account additional reference load due to climatic conditions



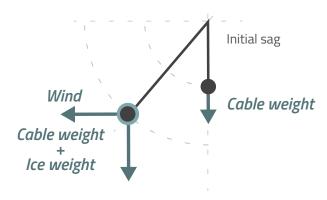
Bad weather conditions cause additional load on the overhead infrastructure.

The load caused by ice increases the weight of the cable as well as the total surface area exposed to the wind.

REMINDER OF STRUCTURES, FIBRES, TESTS

To take account for weather conditions in the formula below, wind load and ice load are included in the calculation of the apparent cable weight:

Apparent weight = $\sqrt{(\text{lce weight + cable weight})^2 + (\text{Wind presure})^2}$



Data relating to the cables is provided by cable manufacturers, and climatic data can usually be found in national standards for buildings/infrastructures.

For example, in the United States, the National Electric Safety Code (NESC) Rule 250B defines 3 regions with typical values for ice thickness, temperature and wind pressure.

	Temperature	Ice thickness	Wind pressure
High	-18°C	12.70mm	192 Pa
Medium	-10°C	6.35mm	192 Pa
Low	-1°C	0.0mm	431 Pa

In France, it is commonly accepted that the additional reference loads due to climatic conditions are 3 times higher than the installation tensions. The table below lists the installation tensions calculated for different overhead drop cables for different spans and the maximum permissible tension for each cable.

			Span b	etween two po	sts with 1% de	flection
Droptic® family	Cable weight (kg/km)	Maximum allowable tension	30m	40m	50m	70m
			Installation	tension/Tension	under referenc	e conditions
LM4	20	800N	75N/225N	100N/300N	125N/375N	175N/525N
LM2BK	13	400N	49N/146N	65N/195N	81N/244N	114N/341N
LX030PU	9	300N	34N/101N	45N/135N	56N/169N	79N/236N
LM030HDPE	8	250N	30N/90N	40N/120N	50N/150N	70N/210N

Droptic® drop cables therefore offer performances that fully meet the conditions for deployment in France.

A good knowledge of the topographical parameters (span, terrain gradient) and climatic parameters makes it possible to anticipate loads and overloads on the overhead infrastructure, and helps to choose the right equipment, cables and clamps, adapted to the area under consideration for a sustainable network.

Cable characterisation tests

All cables are tested according to the international standards EN 60794-1-21 and EN 60794-1-22. These standards define the test conditions for which the performance of cables is stated. The essential characteristics for a cable are as follows:

Test	Test family	Standard	Standard method
Maximum allowable tension	Mechanical	NF EN 60794-1-21	E1
Tensile strength	Mechanical	NF EN 60794-1-21	E1
Crush	Mechanical	NF EN 60794-1-21	E3
Kink	Mechanical	NF EN 60794-1-21	E10
Static bending	Mechanical	NF EN 60794-1-21	E11
Temperature cycling	Environnemental	NF EN 60794-1-22	F1
UV resistance	Environnemental	NF EN 60794-1-22	F14
Fire reaction	Environnemental	EN50575	
Resistance to wind vibrations	Mechanical	NF EN 60794-1-21	E19

For overhead drop cables, in addition to the characterisation of the cable itself, the mechanical link between the anchor and the cable is an important issue in the quality of the overhead network. The compatibility of anchors and cables is therefore systematically checked by carrying out the following qualification tests:

- Tensile tests at the short-term tensile load of the cable (Maximum Allowable Tension) according to the modified E1 method of EN 60794-1-2, involving a couple of anchoring devices over a cable length of more than 1 metre. There shall be no slippage of the cable within the anchor clamps, no deterioration of the cable and no deterioration of the signal (attenuation less than 0.1dB).
- Galloping test of anchor clamps according to method E19
 of EN 60794-1-2, and applying 10 undulations for cables
 up to 6mm diameter, 3 undulations for cables over 6mm
 diameter (distribution and feeder cables) and an optical loss
 measurement for 300 hours.

The optical losses must then be less than 0.1dB during the test.

The CPR standards

The CPR (Construction Products Regulation) standards harmonise test methods to define the reaction-to-fire performance of cables permanently installed in buildings. These are the essential fire requirements for cables. Cables must therefore be tested according to these standards.

The fire reaction is the way a material behaves as a combustible. It is defined by organisations that have carried out various tests. In Europe, CE marked products are identified by Euroclasses for fire reaction. This identification code appears on the cable labels.





D_{ca} s2, d1, a1 (EN50575: 2014)

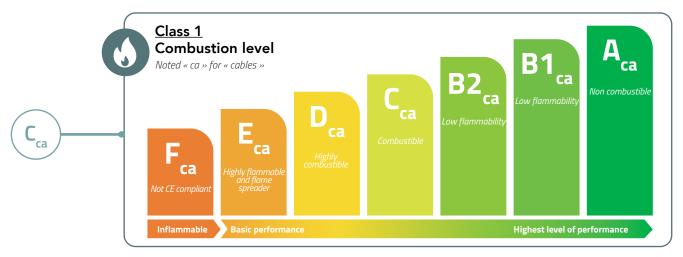
- 4 Initial certification: 18
- 5 Certification body ID: NB 1812
- 6 Declaration of performance ID: DOP 010
- Use: Drop fibre optic cable for FTTH customer connection, installed inside premises and other civil works, designed to prevent the emission and the propagation of fire and smoke.
- 1 Type of cable that will be installed inside a construction work
- 2 Standardised CE marking
- 3 Level of performance and standard used to assess performance
- Year of product qualification

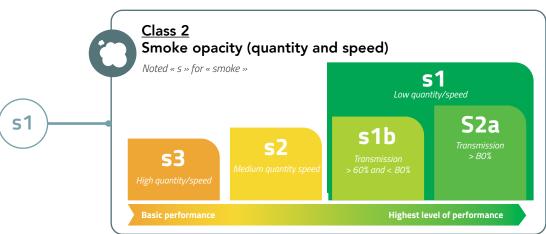
- 6 Certification body ID
- 6 Telenco Declaration of Performance number for this product, available at www.telenco-networks.com
- 7 Intended use of the product

Euroclassifications

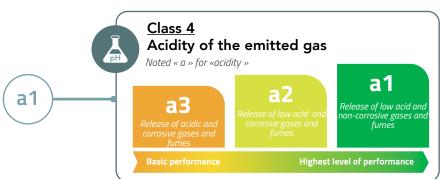
Example of classification











Droptic® and SYCABEL classification

All Telenco indoor cables are qualified according to the test standards described in EN50575. For this reason families of cables for indoor use are classified according to their fire reaction performance level.

The table below from SYCABEL (Professional trade union of electrical and communication wire and cable manufacturers) defines three levels of classification:

- Optimal
- Improved
- Basic

By default, all indoor cables of the DROPTIC® family comply with the SYCABEL Basic classification.

Droptic® FLAME RETARDANCY cables have a performance equivalent to the Improved classification. Finally, the Droptic® FLAME RETARDANCY+ families of cables have a fire performance equivalent to the Optimal classification. The Telenco Group offers different possibilities, to date, represented in the table below

SYCABEL classification	Euroclasses
Optimal	B2 _{ca} - s1, d1, a1
Improved	C _{ca} - s1, d1, a1
Basic	D _{ca} - s2, d2, a2 E _{ca}

Droptic® Classification	LM2	LM1L	LM1	LM7	LM8
DROPTIC® Flame Retardancy +	Х				
DROPTIC® Flame Retardancy	Х	Х			
DROPTIC® Standard	Х	Х	Х	Х	X

Captions and pictograms



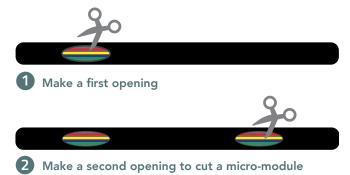




Eline® cables are specially designed for the vertical and/or horizontal distribution of optical fibre outside buildings. They can be deployed in façades, laid in cable trays or pulled into ducts. Thanks to their black LSZH-FR outer sheath, these cables are UV-resistant. In addition, they are equipped with FRP reinforcements, which gives them optimal mechanical performance.

Thanks to their large internal diameter and unassembled micro-modules, Eline® cables enable easy access to the optical fibre by making two openings in the outer sheath.

Below are the steps to be taken:





The fibre extracted from this micro-module is used to make a connection, either by splicing or by installing $900\mu m$ field-mountable connectors, with a patch cable inside a transition box.

Fibre optic connection in an individual dwelling using an Eline® façade cable



- 1 Eline® façade cable
- 2 Eline® Optical Distribution Point
- Bline® Optical Transition Box

Fibre optic connection in a multi-dwelling units using an Eline® riser cable



- 1 Eline® riser cable
- 2 Eline® building Entry Point
- Bline® floor distribution box
- 4 Eline® drop cable Droptic® LM1

ELINE® RISER CABLES

Façade cables

Eline® façade cables

Eline® façade cables are manufactured with a black LSZH-FR outer sheath that provides UV protection. In addition, they are equipped with two swelling cords rods that ensure a watertight seal inside the cable cavity.

They enable easy, quick and secure access to the fibre thanks to the longitudinal marking indicating the position of the FRP reinforcements, their large internal diameter and their construction in unassembled micro-modules.

Product advantages:

- + Fast, easy and secure access to fibre
- + Longitudinal sealing
- + Good mechanical performance

Categories	Characteristics		
Tensile strength	200N		
Crush resistance	50N/cm		
Bending radius	R mini. = 25,0mm		



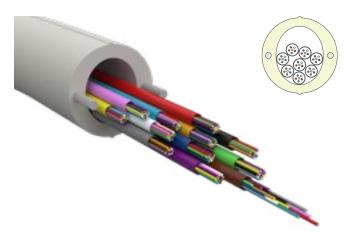


Riser cables

Eline® riser cables

The Eline® riser cable has been specially designed for the vertical distribution of optical fibre inside buildings. It can also be laid in cable trays or pulled into ducts. The cable is manufactured with a white, halogen-free, low-smoke, flame retardant outer sheath. It has a longitudinal mark indicating the position of the FRP reinforcements.

With a large inner diameter and a non-stranded micromodule construction, Eline® riser cable enable easy access to the optical fibre by making an opening in the outer jacket. The fibre extracted from a micro-module is then used to make a spliced connection to a drop cable within a Building Entry Point.



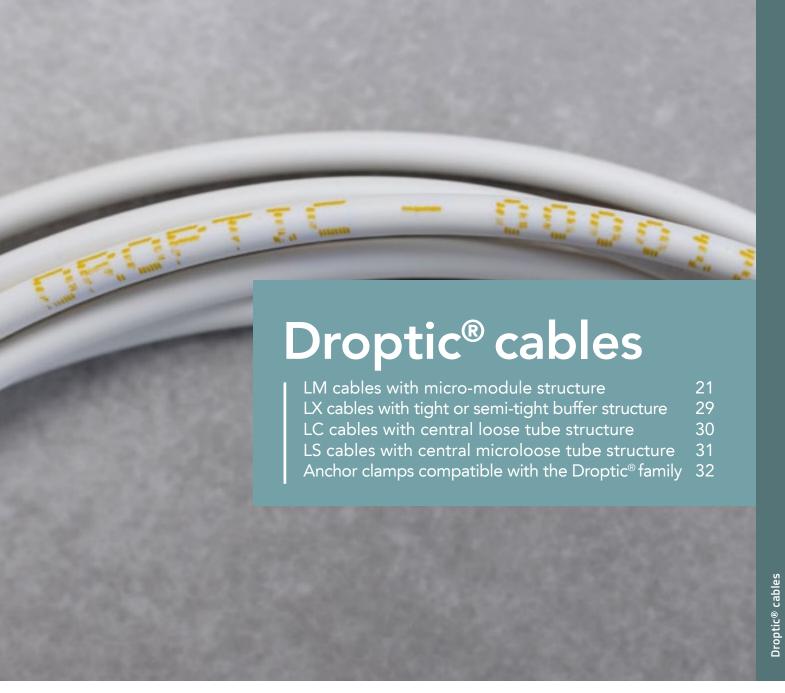
Product advantages:

- + Simple, fast and secure access to fibre
- + Waterproof micro-module containing up to 12 optical fibres
- + Halogen-free, low-smoke, flame-retardant white jacket
- + Good mechanical performance



Ref	Number of fibres per micro-module	Number of fibres	Diameter	Packaging	Weight
91890		12	Ø 7.5mm	4000m cable drum	54.0kg/km
91240		24	Ø 8.5mm		64.0kg/km
91891		36	Ø 9.5mm	2000m cable drum	70.0kg/km
91243	4 OF	48	Ø 9.5mm		77.0kg/km
91239		72	Ø 10.5mm		89.0kg/km
91324		96	Ø 11.5mm	1000m cable drum	102.0kg/km
91236		144	Ø 12.0mm		115.0kg/km
91238		12	Ø 7.5mm	4000m cable drum	54.0kg/km
91231		24	Ø 7.5mm		55.0kg/km
91892		36	Ø 8.5mm	2000m cable drum	64.0kg/km
91233	6 OF	48	Ø 9.0mm		70.0kg/km
92893		72	Ø 9.5mm		77.0kg/km
91235		96	Ø 10.5mm	1000m cable drum	88.0kg/km
91237		144	Ø 11.5mm		102.0kg/km

Categories	Characteristics
Tensile strength	480N
Crush resistance	30N/cm
Bending radius	R mini. = 12.5mm
Fire reaction	D _{ca} - s1, d0, a1







The Droptic® range includes a set of cables with a diameter of less than 6 mm and a number of fibres of less than 24. This range is available in 4 different structures:

1 LM cables with micro-module structure

2 LX cables with tight or semi-tight buffer structure

3 LC cables with central loose tube structure

4 LS cables with central microloose tube structure

The Droptic® range has been developed to meet all network configurations for FTTH fibre deployments:















Into ducts

In cable trays

On façade

Overhea

Indoor

Outdoor

Indoor/ Outdoor

Made from high quality fibre and materials, Droptic® cables are sustainable solutions for building high speed broadband networks.



Indoors, Droptic® patch cables are designed as solutions to improve the daily life of technicians. They offer easy access to the fibre and mechanical performance that makes installation easy and comfortable.

These cables ensure an optimised deployment of the optical fibre from the point of connection to the subscriber's terminal outlet. Depending on the model chosen, they can be laid in cable trays, pulled, pushed, routed inside occupied ducts or simply stapled or glued along skirting boards.

These indoor drop cables are fully compliant with the European Construction Products Regulation (CPR). They are manufactured with LSZH sheaths: halogen-free, low-smoke, and flame retardant.



Droptic® **outdoor** cables offer great versatility. They can be installed both overhead and underground, using pulling techniques, over several hundred metres in length. These cables enable flexibility in network deployments, while offering optimal optical performance.

These outdoor feeder cables are manufactured with black polyurethane outer sheaths that are UV, wear and tear resistant. This gives them high mechanical performance.

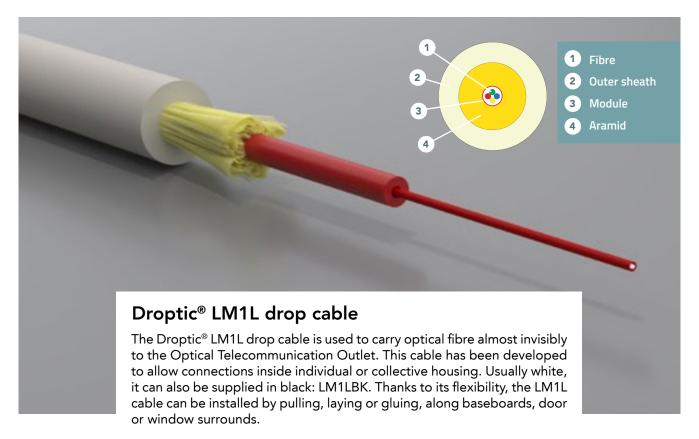
For indoor/outdoor use, some Droptic® cables are made of a double sheath. They are designed to be multi-purpose, allowing for convenient and quick installation during FTTH deployments.

The HDPE outer jacket is easily and quickly stripped to provide access to a Construction Products Regulations compliant inner cable. No intermediate splice is required.



DROPTIC® CABLES

LM cables with micro-module structure



Product advantages:

- + Small diameter for quick and discrete connections
- + Flexible for easy installation
- + Good bending performance

Categories	Characteristics		
Tensile strength	100N		
Crush resistance	100N/cm ($\Delta \alpha \le 0.1dB$) Optical reversibility verified at 200N/cm		
Bending radius	R mini. = 12.5mm		
Fire reaction	D _{ca} - s2, d1, a1		



Rzf	Number of fibres per micro-module	Diameter	Packaging	Weight
90923	1 OF			13.0kg/km
90925	2 OF	Ø 2.8mm	250m reel or 2000m cable drum	13.7kg/km
90927	4 OF		2000m cable aram	15.1kg/km

Droptic® LM1 drop cable

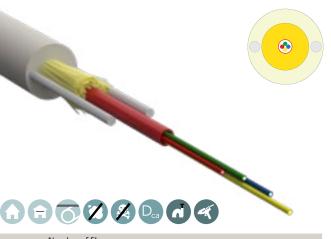
The Droptic® LM1 drop cable is specially designed for FTTH deployments inside buildings. It can be installed by pulling or gluing. Thanks to its small diameter, this cable is suitable for installations in already occupied or congested ducts. It has optimal mechanical performance thanks to the presence of two FRP reinforcements.

Product advantages:

- + Small diameter
- + Easy installation
- + Good crush and tensile strength due to the two FRP reinforcements in the sheath

Categories	Characteristics
Tensile strength	150N
Crush resistance	100N/cm ($\Delta \alpha \le 0.1dB$) Optical reversibility verified at 200N/cm
Bending radius	R mini. = 15mm
Fire reaction	D _{ca} - s2, d1, a1

Telenco reserves the right to change specifications without notice



Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
90364	1 OF		250m reel or	13.0kg/km
90365	2 OF	Ø 3.3mm	1500/2000m cable drum	13.7kg/km
90366	4 OF			15.1kg/km

Droptic® LM2 drop cable

The Droptic® LM2 drop cable is designed to meet a wide range of needs encountered during FTTH deployments, whether indoors or outdoors, on façades, overhead or in ducts.

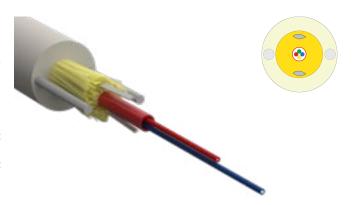
Indoors, it is compatible with all types of installation: pulling, gluing or stapling and is fully compliant with the Construction Products Regulations.

Outdoors, this cable can be installed in ducts over short distances (less than 50 metres). UV-resistant and equipped with two FRP reinforcements and two swelling cords wicks, it offers very good temperature resistance and watertightness.

Product advantages:

- + UV-resistant
- + Extended operating temperature range
- + Good crush and tensile strength due to the two FRP reinforcements in the sheath

Categories	Characteristics	
Tensile strength	400N	
Crush resistance	150N/cm (Δα ≤ 0,1dB) Optical reversibility verified at 200N/cm	
Bending radius	R mini. = 15mm	
Fire reaction	D _{ca} - s2, d1, a1	





Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
90338	1 OF	Ø 4.0mm	250m reel or 1500m cable	13.0kg/km
90340	4 OF		drum	15.1kg/km

Droptic® LM2BK drop cable

The Droptic® LM2BK drop cable is a solution for FTTH deployment in overhead configurations over short distances (up to 50 metres), on façades or in ducts. Its black, UV-resistant outer jacket with two FRP reinforcements allows for use over a wide temperature range.

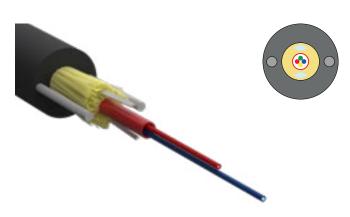
In addition, it is fully compliant with the Construction Products Regulations and can also be deployed indoors.

Product advantages:

- + UV-resistant
- + Extended operating temperature range
- + Optimal mechanical performance due to two FRP reinforcements inside the sheath

Categories	Characteristics
Tensile strength	400N
Crush resistance	100N/cm ($\Delta \alpha \le 0.1dB$) Optical reversibility verified at 200N/cm
Bending radius	R mini. = 20mm
Fire reaction	D _{ca} - s2, d1, a1

Telenco reserves the right to change specifications without notice





Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
90521	1 OF	Ø 4.0mm	1000/1500m cable drum	17.0kg/km
90929	2 OF		2000m	
91579	4 OF		cable drum	19.0kg/km

Droptic® LM3 drop cable

The Droptic® LM3 drop cable is a multi-purpose cable for simple, fast and reliable outdoor/indoor transitions. The cable is robust and waterproof and offers high mechanical performance. It is designed for overhead deployments (spans up to 70 metres) but can also be pulled into ducts over several hundred metres.

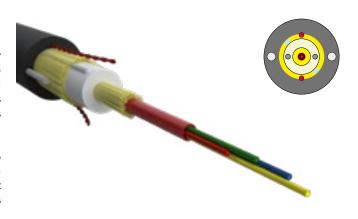
With a double sheath construction, LM3 drop cable has two ripcords that allow the outer HDPE sheath to be stripped in seconds. This allows a halogen-free, low-smoke, flame-retardant LM1 sheathed cable to be installed indoors. No splicing is required between the outer and inner cable.

The Droptic® LM3 cable allows the transmission of the optical signal from a distribution point to the optical Terminal Outlet without straining the optical budget.

Product advantages:

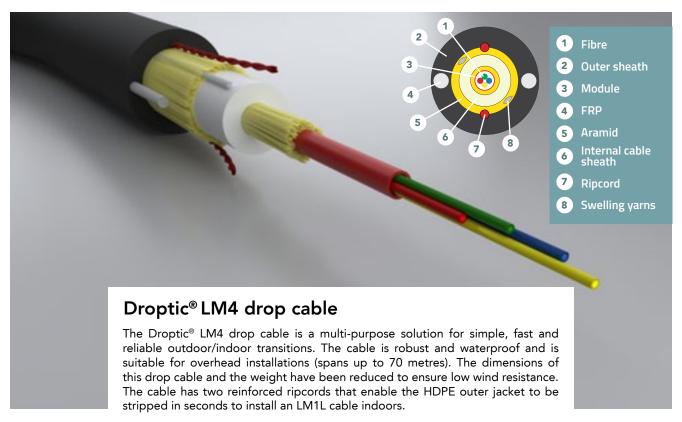
- + Enables quick, simple and reliable outdoor/indoor transitions
- + Extended operating temperature range
- + High mechanical performance

Categories	Characteristics	
Tensile strength	800N	
Crush resistance	200N/cm (Δα ≤0,1 dB) Optical reversibility verified at 300N/cm	
Bending radius	R mini. = 60mm	
Fire reaction	D _{ca} - s2, d1, a1	





Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
90367	1 OF			20.01/1
90368	2 OF	Ø 6.0mm	500/1000m cable drum	29.0kg/km
90369	4 OF		cable aram	30.0kg/km



Product advantages:

- + Enables quick, simple and reliable outdoor/indoor transitions
- + Optimised dimensions for low wind load
- + High mechanical performance

Categories	Characteristics
Tensile strength	800N
Crush resistance	200N/cm ($\Delta \alpha \le 0.1dB$) Optical reversibility verified at 300N/cm
Bending radius	R mini. = 50mm
Fire reaction	D _{ca} - s2, d1, a1



























Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
90531	1 OF			21 01/
90533	2 OF	Ø 5.0mm	500/1000m cable drum	21.0kg/km
90535	4 OF		casic di um	22.0kg/km

Droptic® LM7 drop cable

The Droptic® LM7 drop cable allows a quick and easy connection between an Optical Terminal Outlet and a distribution point, at the basement of a building. Its compact and rectangular design has been specifically designed to be pushed into an already occupied ICTA corrugated duct and thus facilitate the installation inside the ducts. This cable is equipped with two FRP reinforcements for high mechanical performance.

Poduct advantages:

- + Rectangular and compact design for easy installation in occupied ducts and sheath
- + Flexible and rigid at the same time
- + Optimal mechanical performance

Categories	Characteristics
Tensile strength	150N
Crush resistance	100N/cm ($\Delta \alpha \le 0.1dB$) Optical reversibility verified at 200N/cm
Bending radius	R mini. = 15mm
Fire reaction	Eca

Telenco reserves the right to change specifications without notice





Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
90541	1 OF		250m coil or	
90543	2 OF	2.6mm x 1.8mm	2000m cable	6.0kg/km
90545	4 OF	X 1.011111	drum	

Droptic® LM8 drop cable

The Droptic® LM8 drop cable is a modular solution. Its robust design meets the different needs of FTTH deployments between distribution points and subscribers. The cable is dielectric and can be installed indoors or outdoors for the connection of single or multi dwelling units. Thanks to its watertight construction, Droptic® LM8 drop cable can also be installed in ducts over short distances (less than 50 metres). Its two FRP reinforcements ensure good temperature resistance. Indoors, this cable is compatible with all types of installation: pulling, gluing or stapling and is fully compliant with the Construction Products Regulations.

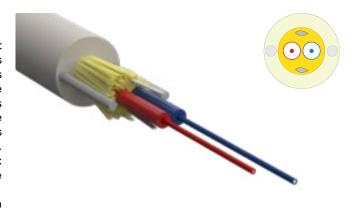
The Droptic® LM8 patch cable features two optical fibres in two separate modules for differentiated management of the two modules.

Poduct advantages:

- + A single drop cable for indoor FTTH configurations, façade deployment or short distance ducting
- + Extended operating temperature range
- + Compatible with all types of cable laying

Categories	Characteristics
Tensile strength	400N
Crush resistance	150N/cm (Δα ≤ 0,1dB) Optical reversibility verified at 200 N/cm
Bending radius	R mini. = 20mm
Fire reaction	D _{ca} - s2, d1, a1

Telenco se réserve le droit de modifier les spécifications sans préavis





Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
90341	2 OF	4.0mm	250m reel or 1500m cable drum	13.7kg/km

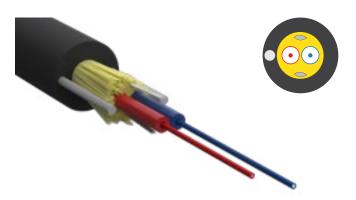
Droptic® LM8BK drop cable

The Droptic® LM8BK drop cable is a solution for FTTH deployments on façades or underground over short distances (up to 50 meters). Consisting of a black, UV-resistant LSZH-FR jacket with two FRP reinforcements, the LM8BK cable can be used over a wide temperature range. In addition, it is fully compliant with the Construction Products Regulations and can also be deployed indoors. The Droptic® LM8BK patch cable features two optical fibres in two separate modules. This enable differentiated management of the two modules.

Product advantages:

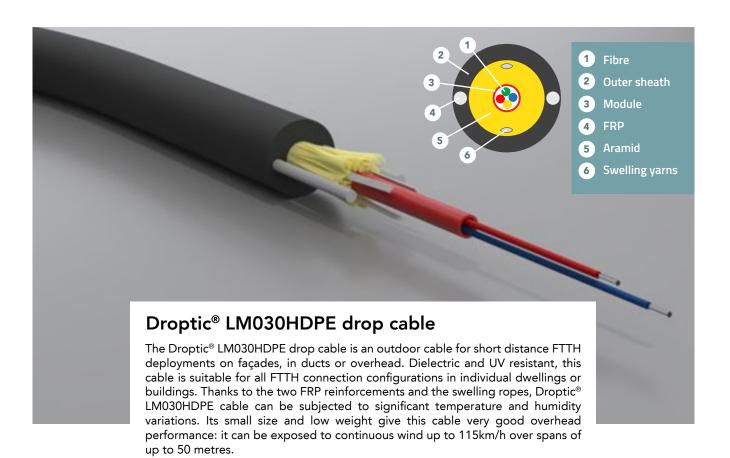
- + A single drop cable for indoor FTTH configurations, façade deployment or short distance ducting
- + UV-resistant
- + Compatible with all types of cable laying

Categories	Characteristics
Tensile strength	400N
Crush resistance	100N/cm ($\Delta \alpha \le 0.1dB$) Optical reversibility verified at 200N/cm
Bending radius	R mini. = 20mm
Fire reaction	D _{ca} - s2, d1, a1





Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
90523	2 OF	Ø 4.0mm	1000/1500/ 2000m cable drum	19.0kg/km



Product advantages:

- + Dilectric and UV-resistant
- + Small size and light weight
- + Very good overhead performance

Categories	Characteristics
Tensile strength	250N, cable elongation< 0.5 %, fibre elongation < 0.3 %
Crush resistance	200N/cm ($\Delta \alpha < 0.05$ dB) Optical reversibility verified at 250N
Bending radius	R mini. = 15mm















Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
93461	1 OF			
93462	2 OF	Ø 3.3mm	2000m cable drum	8.0kg/km
93463	4 OF			

Droptic® LM040BK adducting cable

The Droptic® LM040BK adducting cable is an indoor/outdoor building feeder cable for FTTH deployments on façades or in ducts. It can also be used overhead for short distances (maximum range 50 meters).

Dielectric and UV-resistant, this cable is suitable for outdoor installations for all FTTH connection configurations in single or multi dwelling units. Available in black or ivory, its LSZH jacket allows it to be deployed inside the building via risers, ducts or horizontal cable trays.

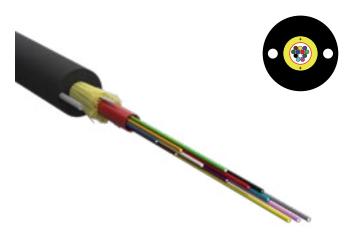
Thanks to the two FRP reinforcements and the swelling yarns, the Droptic® LM040BK cable can be subjected to significant temperature variations.

Its small size, light weight and structure make it easy to install and access the fibre.

Product advantages:

- + Dielectric and UV-resistant
- + Easy installation
- + Easy and quick access to the fibre

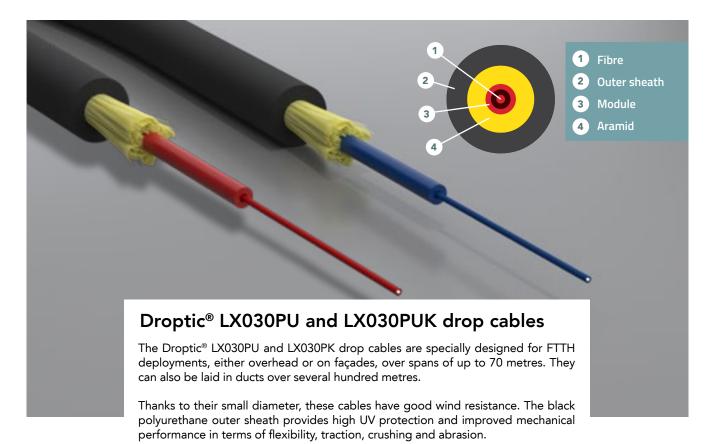
Categories	Characteristics
Tensile strength	400N, cable elongation < 0.5 %, fibre elongation < 0.3 %
Crush resistance	$100N/cm$, $\Delta lpha < 0,05dB$ to $1550nm$ Optical reversibility verified at $150N$
Bending radius	R mini. = 20mm, Δα < 0.1dB à 1550nm
Fire reaction	D _{ca} - s2, d1, a1





Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
93467	6 OF			
93468	8 OF	Ø 4.1mm	1500m cable drum	19.0kg/km
93469	12 OF		cable aram	

LX cables with tight or semi-tight buffer structure



Product advantages:

- + UV-resistant
- + Light weight
- + Small diameter for low wind load
- + High mechanical performance

Categories	Characteristics		
Cable	LX030PU LX030PUK		
Tensile strength	300N	400N	
Crush resistance	100N/cm ($\Delta \alpha \le 0.1dB$) Optical reversibility verified at 200N/cm		
Bending radius	radius R mini. = 12.5mm		



Designation	Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
LX030PU	09289	- 1 OF	Ø 3.0mm	2000m	8.0kg/km
LX030PUK	On request	TOF	Ø 3.0mm	cable drum	9.0kg/km

Droptic® LX048DS drop cable

The Droptic® LX048DS drop cable is specifically designed to be deployed in overhead configurations with spans of up to 70 metres, either on the façade or in conduit. Thanks to its small diameter, this cable is a truly discreet solution for FTTH deployment.

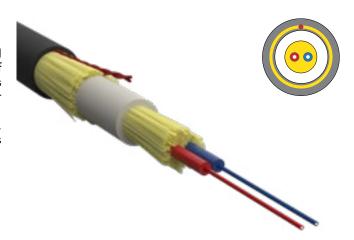
Thanks to its double jacket and the presence of a ripcord, Droptic® LX048DS cable allows convenient and fast installations for indoor and outdoor applications

Product advantages:

- + Discreet connection
- + Highly versatile
- + Lightweight

Categories	Characteristics
Tensile strength	500N
Crush resistance	100N/cm ($\Delta \alpha \le 0.1dB$) Optical reversibility verified at 200N/cm
Bending radius	R mini. = 15mm
Fire reaction	D _{ca} - s1, d0, a1

Telenco reserves the right to change specifications without notice







Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
92440	1 OF	Ø 4.8mm	500m	22 01/1
91835	2 OF	Ø 4.0mm	cable drum	23.0kg/km

LC cables with central loose tube structure

Droptic® LC050HDPE drop cable

The Droptic® LC050HDPE drop cable is used to interconnect buildings. Its HDPE sheath facilitates pulling in different types of conduits, especially in concrete.

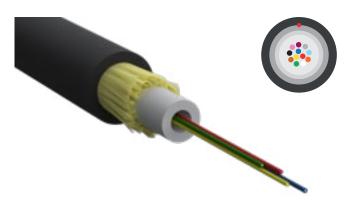
This cable has a light and robust structure with a central tube and easy access to the fibre thanks to the presence of tearing wires.

Fully dielectric and equipped with glass yarns around the central tube, this cable guarantees good mechanical performance and improved protection against rodents.

Product advantages:

- + Easy installation
- + Fully dielectric
- + High mechanical performance
- + Protection against rodents

Categories	Characteristics		
Tensile strength	900N		
Crush resistance	1000N		
Bending radius	R mini. = 20mm		











LS cables with central microloose tube structure

Droptic® Nano blowable cables

Droptic® Nano blowable cables are used for outdoor applications. Its black HDPE outer sheath provides good sealing and UV resistance, ensuring optimum mechanical performance.

Droptic® Nano blowable cables have been especially designed to be blown in microducts with a diameter from 3.5mm up to 6mm.

Product advantages:

- + UV-resistant
- + Waterproof
- + Blowable on long distance, up to 2000m

Categories	Characteristics			
Cable	LS024HDPE 4 OF	LS035HDPE 12 OF	LS038HDPE 24 OF	
Tensile strength	20	300N		
Crush resistance	100N/cm			
Bending radius				



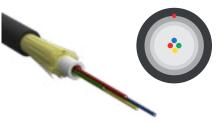








Designation	Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
LS024HDPE		4 OF	Ø 2.4mm	4000m cable drum	5.0kg/km
LS035HDPE	On request	12 OF	Ø 3.5mm		10.4kg/km
LS038HDPE		24 OF	Ø 3.8mm		12.7kg/km



LS024HDPE 4 OF G.657A2

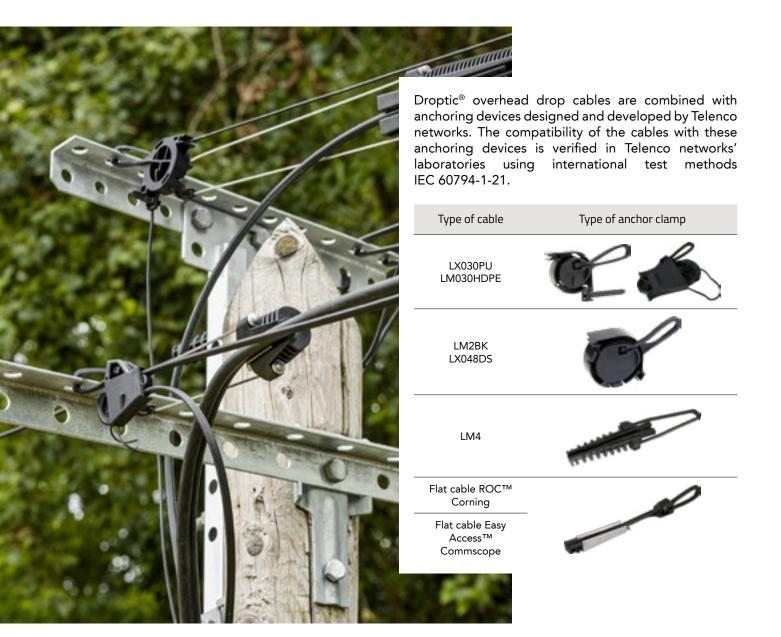


LS035HDPE 12 OF G.657A2



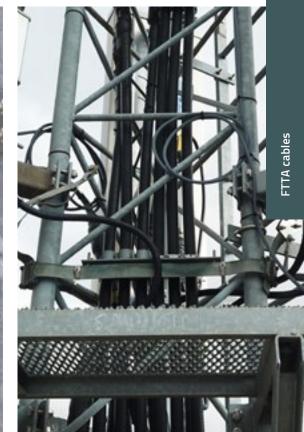
LS038HDPE 24 OF G.657A2

Anchor clamps compatible with the Droptic® family









The 3rd generation mobile technology, 3G, was able to offer speeds of around 1.9 Mbit/s. 4G, based on the LTE standard, offers speeds of up to 150 Mbit/s. With theoretical speeds of 6 to 60 times higher and virtually no latency, the fifth generation, 5G, is once again opening up the field of possibilities.

The challenge of today's mobile networks, well beyond the simple exchange of voice or data, opens up opportunities for use in all areas: industry, health, mobility, the economy, Smart Cities, machine learning, services, etc. But it is also a real bridge towards access to new technologies for many territories that are poorly served or not served by cabled networks.

It is in this context of digital revolution and based on its expertise in outdoor optical telecom networks that Telenco networks has taken up the challenge of 4G/5G FTTA. By applying the principles of eco-design and taking into account the climatic conditions and harsh mechanical environments, Telenco networks designs, manufactures and markets reliable and quality 4G/5G FTTA optical products. Considering all technical, economical and environmental aspects, Telenco networks offers real solutions for all 4G/5G cabling configurations whatever the given architecture.



Glossary

- BTS = Base Transceiver Stations
- BBU = Base Band Unit
- RRU = RRH = Remote Radio Unit = Remote Radio Head
- FTTA = Fiber To The Antenna
- HTTA = Hybrid To The Antenna
- PTTA = Power To The Antenna
- Breakout = Trunk
 or pre-connected or semi-preconnected
 optical cable



FTTA CABLES

Breakout cables

Outdoor pre-connected breakout cable 2 OF

The outdoor pre-connected breakout cable 2 OF has been specifically designed to connect the BTS/BBU to the RRU/RRH in the 4G/5G direct cabling structure, or the junction box (FTTA or HTTA) to the RRU in the 4G/5G indirect cabling structure.

Using its expertise in overhead cable deployment, Telenco networks has developed a solution that withstands harsh environments while maintaining a lightweight but highly durable cable structure. The pre-connected outdoor 2 OF breakout cable has a diameter of 5.0mm, which ensures flexibility and ease of installation.



- + Premium optical quality
- + Excellent mechanical performance
- + Easy to install and set up
- + Flexible and lightweight cable

Categories	Characteristics		
Tensile strength	450N		
Crush resistance	100N/cm		
Twist	± 180°/m, L = 120N ≤ 0.1dB/km		





Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
On request	2 OF	Ø 5.0mm	2000m cable drum	22.0kg/km

Outdoor pre-connected breakout cable 12-24 OF

FTTA High Performance outdoor pre-connected breakout cable 12-24 OF is specially designed to connect the BTS/ BBU to the junction box (FTTA or HTTA) in the 4G/5G indirect cabling structure. It is subject to harsh climatic conditions and can withstand temperature changes and high mechanical stress.

Thanks to its expertise in the deployment of overhead cables, Telenco networks has developed a solution that withstands harsh environments by keeping a light but very resistant cable structure to adapt to different installations. This cable is available in 2 capacities, 12 FO and 24 FO, in pre-connected 1 side or 2 sides versions.

Product advantages:

- + Premium optical quality
- + Design spécifique FTTA
- + Excellent mechanical performance
- + Easy to install and set up
- + Small diameter cable

Categories	Characteristics		
Tensile strength	Installation: 660N Functioning: 330N		
Crush resistance	Long: 30N/cm Short: 100N/cm		
Twist	$\pm 180^{\circ}$ /m, L = 120N ≤ 0.1 dB/km		

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Ref	Number of fibres per micro-module	Diameter		Weight
0	12 OF	Ø 6.4mm	1000m	41.0kg/km
On request	24 OF	Ø 8.0mm	cable drum	69.0kg/km

Xtrem Fire drop cables

Xtrem Fire drop cables are designed for indoor/outdoor installations. These cables are very robust for outdoor applications due to their dielectric, waterproof and rodent resistant properties.

They also provide high protection for indoor applications thanks to their high fire resistant LSZH thermoplastic outer jacket. In addition, these cables are lightweight and flexible, making them easy to install.



CDG Xtrem Fire 2 OF

NEXO Xtrem Fire 2-24 OF



- + Anti-rodent protection
- + Flexible and easy to install cable











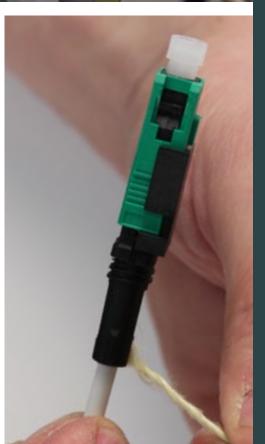


Categories	Characteristics			
Cable	CDG Xtrem Fire 2 OF	NEXO Xtrem Fire 2-24 OF		
Tensile strength	Installation: 1100N Functioning: 650N	2200N		
Crush resistance	130N/cm	150N/cm		
Bending radius	20 x Ø 6.2mm	Installation: $15 \times \emptyset 8,2mm$ Functioning: $10 \times \emptyset 8,2mm$		
Fire reaction	C _{ca} - s1a, d0, a1	C _{ca} - s1a, d0, a1		

Designation	Ref	Number of fibres per micro-module	Diameter	Packaging	Weight
CDG Xtrem Fire 2 FO	0	2 OF	Ø 6.2mm	2000m	38.0kg/km
NEXO Xtrem Fire 2-24 FO	On request	2 to 24 OF	Ø 8.2mm	cable drum	72.0kg/km







PACKAGING AND RELATED SERVICES

The different types of packaging

 $\mathsf{Eline}^{\scriptscriptstyle{\textcircled{\tiny{\$}}}}$ cables are supplied in reels or coils when pre-connected.

Droptic® drop cables are offered in three types of packaging:

- Cable drum
- Coil
- Cable dispenser

On request, the packaging can be customised and the cardboard can be printed with a visual of your choice.

Cable drum

Catégories	Value
Type of cable	Standard delivery length
Eline® façade cable Eline® riser cable	1000m 2000m 4000m
LM1L	1000m 2000m
LM1	1500m
LM2	1500m
LM4	500m
LX030PU	2000m

Coil

The coils are available in several versions:

- Bare cable
- Pigtail: pre-connection on one side of the cable
- Cord: pre-connectorisation on both sides of the cable

The lengths available are variable: from 25m to 250m.





Cardboard dispenser

For ease of installation in the field, Droptic® cables can be packaged in cardboard dispenser on request. Due to their construction and strength, the reels allow the cable to be unwound and rewound without effort. In addition, the reels can be reused.

A cardboard dispenser is constructed as follows (for a maximum weight of 15kg):

- Two rectangular frames
- Two flanges
- A central tube with a defined diameter

The length of cable wound on the reel is adjustable depending on the needs encountered and the type of cable chosen. Three sizes of reels are available: XS, S and XL. The delivery details of these reels are shown in the table below.



Catégories		Values	
Reel size	XS	S	XL
Box size	205 x 195 x 65mm	260 x 270 x 60mm	260 x 260 x 160mm



			XS	S	XL
Туре	of cable	Cable diameter	Maximum delivery length		
•	LM1L	Ø 2.8mm	50m	100m	400m
•	LX030PU	Ø 3.0mm	50m	100m	400m
	LM1	Ø 3.3mm	30m	50m	300m
	LM2	Ø 4.0mm	25m	50m	250m
(o)	LM4	Ø 5.0mm	10m	30m	100m
•	LM7	2.6mm x 1.8mm	30m	50m	300m

Related services

Telenco networks offers to pre-connect Eline® riser cables and Droptic® drop cables with several types of connectors depending on the network configuration and requirements.

Specific connectors

To provide its customers with ever more innovative solutions, Telenco networks offers and assembles specific connectors to ensure the security and durability of fibre optic networks.

Telenco® Secure SC connectors



Telenco® Secure SC connectors are high-end, self-locking fibre optic cabling systems. They are used to protect sensitive networks from disconnection errors or vandalism.

SC connectors with permanent protection



SC connectors with permanent protection enable connectors to be kept on standby. Multiple connections/disconnections can be made without risk to the optical sides and with time savings for the users, while bringing a real ecological gain to installations requiring intensive patching.

Telenco® field mountable connectors

#Telenco



Droptic® cables are compatible with field mountable connectors.

Field mountable connectors offer similar optical performance to standard connectors. They are quick and easy to install on site, while ensuring high reliability. These connectors can be installed on $250\mu m,~900\mu m$ or 3mm fibre optic cables.

OptiTap® Corning hardened connectors





Telenco networks is licensed to fit OptiTap® Corning hardened connectors.

OptiTap® Corning hardened connectors can be fitted to Droptic® LM4, LX030PU and LX030PUK drop cables when packaged in a coil.



Packaging and related services

Standard connectors

Single-mode (SM) connectors



Multi-mode (MM) connectors



Cable protection

Telenco networks also provides expertise in cable protection. This is very important to maintain the properties of the cables and to ensure efficient optical performance.

Eline® and Droptic® cable protective end caps

Telenco networks offers specific protective end caps with a pull end to protect the ends of pre-connected cables during installation. The length of the protective end cap can be adjusted on request, from 30cm to 1m.



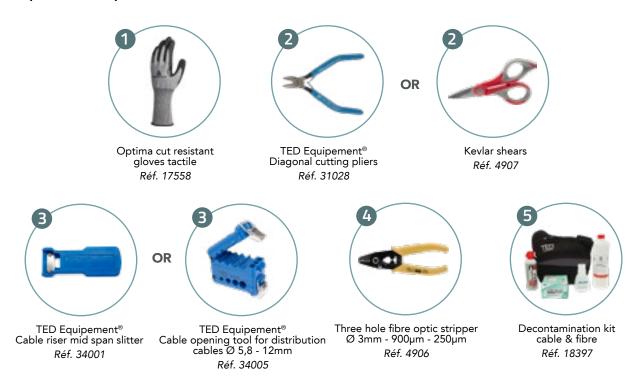
Cable preparation

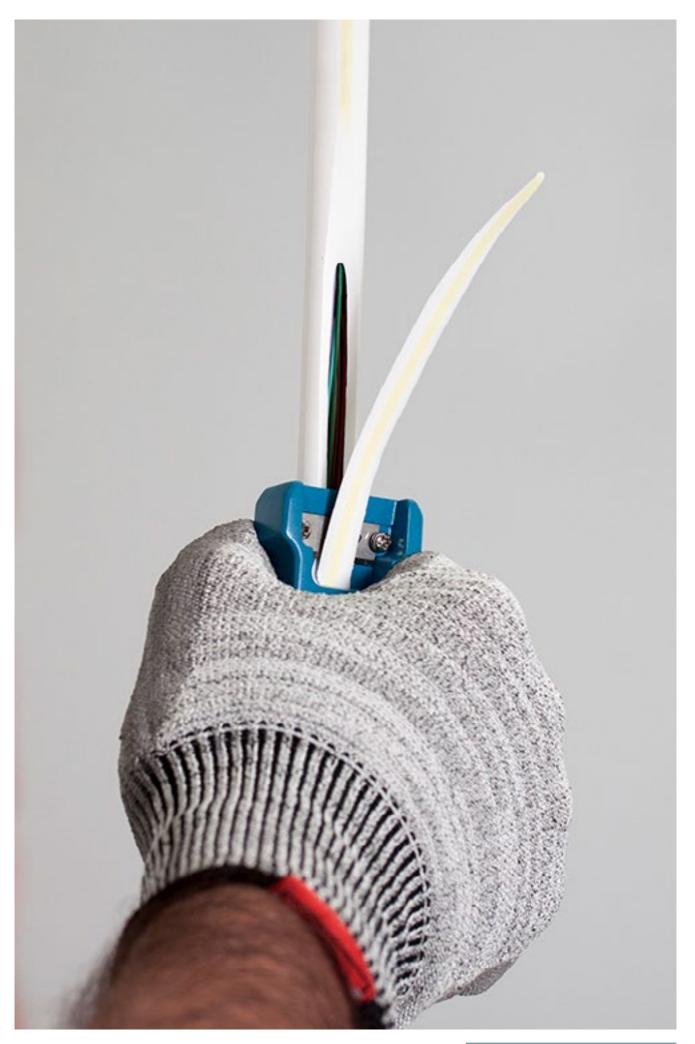
To prepare the cables and access the optical fibre, these tools are indispensable.

Eline® riser cable:



Droptic® drop cable:





TELENCO: INNOVATION AT THE SERVICE OF WORLDWIDE NETWORKS

Telenco is a group of entities specialised in the design, manufacture and global marketing of future-proof solutions for telecom and datacom infrastructures. Since 1999, the Group has organized its business activity on offering innovative solutions meeting the field challenges of each specific market.

A PROVEN EXPERTISE

DESIGN



over **20 years**of R&D expertise and
an integrated test laboratory

MANUFACTURE



18 000m² of production units in Europe and Tunisia

LOGISTICS



21 000m² of storage area in the world

A CERTIFIED INDUSTRIAL PLAYER...





...AT THE CORE OF A NETWORKS OF EXPERTS IN TELECOMMUNICATIONS

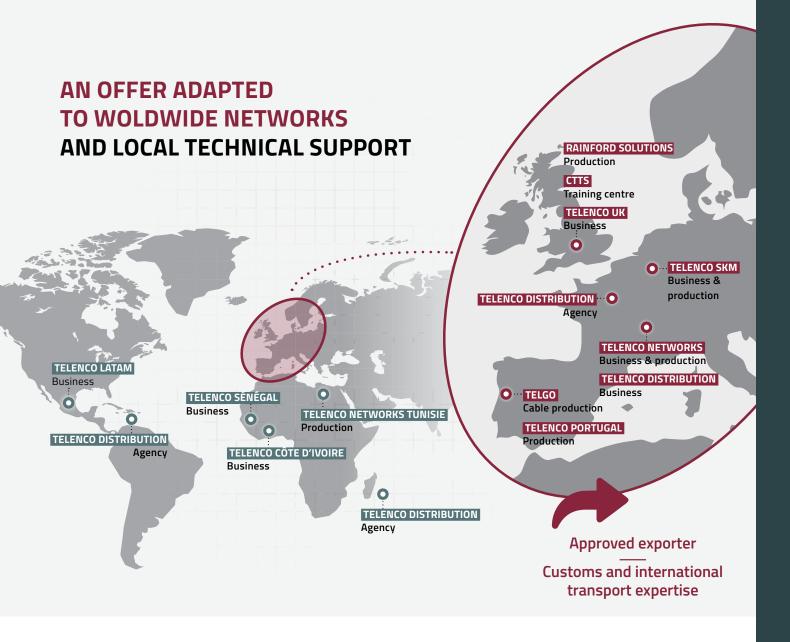
Member of ARCEP expert committee











A RESPONSIBLE & SUSTAINABLE COMPANY

Committed to its employees, the environment and social inclusion



Discover all of our CSR actions on: www.telenco-group.com





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Expert technical support at one click away!

- Downloadable technical documentation
- Custom FO patch cable configurator
- Technical and product focus





Contact our teams!

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