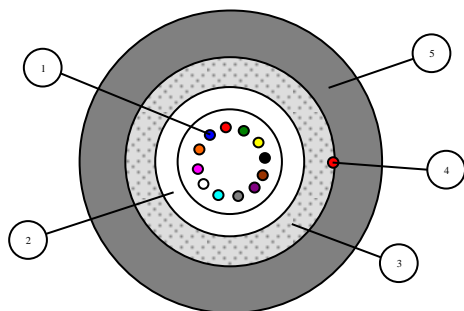




CABLE DESCRIPTION – APPLICATIONS

Central loose tube, outdoor, fully dielectric FO cables suitable for drawing or air-blown installation in plastic cable ducts, for laying on open or protected trenches or cable trays. They are protected against longitudinal moisture penetration through dry, swellable elements. The layer of glass yarns used as strain relief elements provide extra tensile strength, basic dielectric protection against rodents and prevent peripheral penetration of water. These cables are specially designed for fast and low-cost fiber optic deployment in trunk, urban (metropolitan) or local telecommunication networks and they can be successfully used in any **FTTx** infrastructure.

CABLE DESIGN



Note 1: 12-fiber cable is illustrated
Note 2: drawing is not to scale

- 1. Optical fiber:** Coloured glass fiber.
- 2. Loose tube:** PBT tube, filled with jelly compound.
- 3. Reinforcing elements:** Glass yarns with water blocking coating.
- 4. Ripcord:** Polyester or aramide thread of sufficient strength.
- 5. Outer jacket:** Black, UV resistant PE.

No. of fibers	4	6	8	12	16	24
No. of loose tubes	1	1	1	1	1	1
No. of fibers / tube	4	6	8	12	16	24
Outer sheath thickness (nominal) (mm)	1.3	1.3	1.3	1.3	1.3	1.3
Cable overall diameter (nominal) (mm)	7.0	7.0	7.0	7.0	7.0	7.0
Cable weight (nominal) (kg/km)	45	45	45	45	45	45

STANDARDS

IEC 60794-1, IEC 60794-3

CABLE MECHANICAL & ENVIRONMENTAL CHARACTERISTICS

Parameter	Tested according	Specified value	Acceptance criteria
Tensile strength (short term – installation)	IEC 60794-1-21E1	1500 N	$\Delta\alpha < 0.05$ dB reversible, fiber strain < 0.33 %
Tensile strength (long term – operation)	IEC 60794-1-21E1	400 N	$\Delta\alpha < 0.05$ dB reversible, no fiber strain
Crush resistance (short term)	IEC 60794-1-21E3	2000 N/10cm	$\Delta\alpha < 0.05$ dB reversible, no damage
Crush resistance (long term)	IEC 60794-1-21E3	1000 N/10cm	$\Delta\alpha < 0.05$ dB reversible, no damage
Impact resistance	IEC 60794-1-21E4	10 N. m, 3 impacts spaced, R= 30 mm	$\Delta\alpha < 0.05$ dB reversible, no damage
Torsion	IEC 60794-1-21E7	$\pm 180^\circ$, 3 cycles, 50 N	$\Delta\alpha < 0.05$ dB reversible, no damage
Bending (static)	IEC 60794-1-21E11	R= 10 x D, 5 turns, 3 cycles	$\Delta\alpha < 0.05$ dB reversible, no damage
Repeated bending (dynamic)	IEC 60794-1-21E6	R= 15 x D, 100 N, 30 cycles	$\Delta\alpha < 0.05$ dB reversible, no damage
Temperature cycling	IEC 60794-1-22F1	-25°C to +70°C	$\Delta\alpha < 0.05$ dB/km
Water tightness	IEC 60794-1-22F5b	3m cable, 1 m water column, 24 h	no water detected with UV light

IDENTIFICATION COLOUR CODING

Fiber colours per tube (Black ring on fibres 13-24)

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

Note: Other fiber and / or tube colour coding can be provided if requested.



SHEATH MARKING

The following information is printed (ink injection method) in contrasting colour, on outer jacket, every one (1) meter:

“HELLENIC CABLES – year of manufacture – A-DQ(ZN)B2Y 12 E9/125 – length marking m”

Other or additional data can be printed on outer jacket if requested.

PACKING

The cables are delivered in non-returnable wooden drums suitable for safe transportation, storage and installation. Both cable ends are accessible for testing and tightly covered with shrink-down end caps to prevent ingress of moisture. Cable type, customer, drum no, cable length, net and gross weight are tagged on drum flanges.

Standard cable length per drum: 2000 ± 100m, 4000 ± 200m, or 6000 ± 200m.

Any particular requirements about packing, drum marking, cable length per drum can be provided if requested.

QUALITY CONTROL

All cables are quality tested in every stage of manufacturing procedure (raw materials receive, fiber colouring, fiber buffering, stranding, final cable, packing) to ensure a product of the highest quality level.

Detailed routine test reports (OTDR - attenuation in dB/km) will be delivered for all fibers, for all drums ordered.

BASIC CHARACTERISTICS OF OPTICAL FIBERS

The cables can be ordered with all available categories of single mode and / or multimode optical fibers.

A. SINGLE-MODE OPTICAL FIBERS (typical values)

Parameter	G652D	G655D	G657A1
Cladding diameter	125.0 ± 0.7 µm	125.0 ± 0.7 µm	125.0 ± 0.7 µm
Coating diameter (non-colored)	245 ± 10 µm	245 ± 10 µm	245 ± 10 µm
Core concentricity error	≤ 0.6 µm	≤ 0.5 µm	≤ 0.6 µm
Cladding non-circularity	≤ 1.0 %	≤ 0.7 %	≤ 1.0 %
Coating-Cladding concentricity error	≤ 12 µm	≤ 12 µm	≤ 12 µm
Mode field diameter at 1310nm	9.2 ± 0.4 µm	-	9.2 ± 0.4 µm
Mode field diameter at 1550nm	10.4 ± 0.5 µm	9.6 ± 0.4 µm	10.4 ± 0.5 µm
Attenuation coefficient at 1310nm	≤ 0.36* dB/km	-	≤ 0.36* dB/km
Attenuation coefficient at 1383nm	≤ 0.35* dB/km	-	≤ 0.35* dB/km
Attenuation coefficient at 1550nm	≤ 0.23* dB/km	≤ 0.24* dB/km	≤ 0.23* dB/km
Attenuation coefficient at 1625nm	≤ 0.26* dB/km	≤ 0.26* dB/km	≤ 0.26* dB/km
Cable cut-off wavelength λ _{cc}	λ _{cc} ≤ 1260 nm	-	λ _{cc} ≤ 1260 nm
Chromatic dispersion coefficient at 1285-1330 nm	≤ 3.5 ps/(nm·km)	-	≤ 3.5 ps/(nm·km)
Chromatic dispersion coefficient at 1550 nm	≤ 18 ps/(nm·km)	-	≤ 18 ps/(nm·km)
Chromatic dispersion coefficient at 1530-1565nm	-	2.0 – 6.0 ps/(nm·km)	-
Chromatic dispersion coefficient at 1565-1625nm	-	4.0 – 11.2 ps/(nm·km)	-
PMD individual fiber	≤ 0.2 ps/√km	≤ 0.1 ps/√km	≤ 0.2 ps/√km

B. MULTI-MODE OPTICAL FIBERS (typical values)

Parameter	Graded index 62.5/125 OM1	Graded index 50/125 OM2	Graded index 50/125 OM3	Graded index 50/125 OM4
Core diameter	62.5 ± 2.5	50 ± 2.5	50 ± 2.5	50 ± 2.5
Cladding diameter	125.0 ± 1.0 µm	125.0 ± 1.0 µm	125.0 ± 1.0 µm	125.0 ± 1.0 µm
Coating diameter (non-colored)	245 ± 10 µm	245 ± 10 µm	245 ± 10 µm	245 ± 10 µm
Core concentricity error	≤ 1.5 µm	≤ 1.5 µm	≤ 1.5 µm	≤ 1.5 µm
Cladding non-circularity	≤ 1.0 %	≤ 1.0 %	≤ 1.0 %	≤ 1.0 %
Attenuation coefficient at 850 nm	≤ 3.0* dB/km	≤ 2.8* dB/km	≤ 2.5* dB/km	≤ 2.5* dB/km
Attenuation coefficient at 1300 nm	≤ 1.0* dB/km	≤ 0.7* dB/km	≤ 0.6* dB/km	≤ 0.6* dB/km
Bandwidth at 850 nm	200 Mhz. km	500 Mhz. km	1500 / 2000 Mhz. km	3500 / 4700 Mhz. km
Bandwidth at 1300 nm	500 Mhz. km	500 Mhz. km	500 / 500 Mhz. km	500 / 500 Mhz. km
Numerical Aperture	0.275±0.015	0.200±0.015	0.200±0.015	0.200±0.015

*: guaranteed maximum cabled values – actual values are much lower.

Note: Cables with optical fibers complying with special requirements can be provided if requested.