Telecom cables

product portfolio

HELLENIC CABLES

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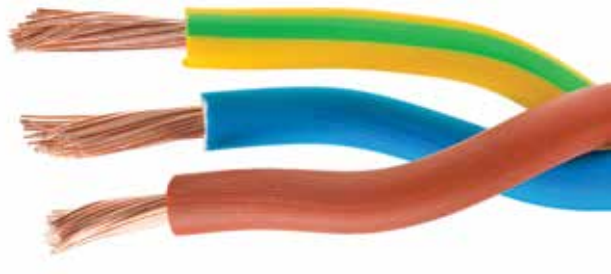


With a wide portfolio of reliable and sustainable cable solutions for international customers, Hellenic Cables is one of the largest cable producers.

The Company is globally active in the energy transmission and distribution markets in the renewable energy sources, telecommunications and data transmission, construction and industry sectors, and is distinguished for its strong exports orientation.

Hellenic Cables represents the cable production and marketing sector of Viohalco S.A. The Company started its activities in 1950 as a Viohalco plant and in 1973 was incorporated as an independent subsidiary under the name Hellenic Cables, expanding its production and trade operations. Today, Hellenic Cables consists of Hellenic Cables S.A. which operates two plants in, Greece that produce cables, and plastic and elastomer compounds; the Fulgor S.A. plant in Corinth, Greece, which manufactures power cables, power and fibre optic submarine cables and copper wires; Icme Ecab S.A., a power and telecommunication cable manufacturer in Bucharest, Romania and Lesco Ltd Blagoevgrad, Bulgaria which manufactures wooden reels and pallets.

With a strong focus on development of value added products, such as high and extra-high voltage cables and submarine cables, the Company implements significant investments towards enriching its product portfolio and enhancing its sustainability profile. The Company has implemented a EUR 280 million approximately investment plan since 2011 for the production of high and extra-high voltage submarine and underground cables.

The Company's wide product range extends to PVC, EPR and XLPE insulated power cables (rated up to 500kV), marine and low smoke halogen free cables, fire resistant cables, telecommunication, signal and data cables with copper conductors or optical fibres, as well as fire retardant halogen free plastic and elastomer compounds. Cables are supplied to a variety of international standards, such as VOE, CEI, ICEA, NF, SEN, BS, UL, NEMA, JIS, ASTM, DIN, IEC, ITU and ELDT. Many of the Company's products are certified by BASEC, VOE, IMQ, NF-USE, NETWORK RAIL, KEMA, DNV and UL.

Technical know-how is combined with continual investment in state-of-the-art machinery, to ensure levels of efficiency and quality which meet the strictest standards. The Company's Quality Management System is certified to ISO 9001:2015, its Environmental Management System to ISO 14001:2015 and its Occupational Health and Safety to ISO 45001:2018. Hellenic Cables has the necessary expertise to develop and offer turnkey solutions that meet specific demands of its customers.

Commitment to quality and sustainable development has been a key factor in enabling Hellenic Cables to establish a strong market position internationally. The Company's highly experienced technical and managerial staff have a strong commitment to innovation, technological excellence and outstanding quality, which ensures that users of Hellenic Cables' products have made a reliable and sustainable choice.

Hellenic Cables aims to constantly improve its offering and respond swiftly to changes in customer requirements around the world with reliable and safe products, based on environmentally friendly technologies. At the same time, the Company places strong emphasis on the development of its people and the creation of value for its shareholders, partners and the communities in which it operates. Looking ahead, the Company plans additional investments in technology and innovative cable solutions, as a way of contributing to the creation of a sustainable future for its stakeholders.

Submarine & Power Cables

Rubber & Plastic Compounds

Power Cables

Telecommunication & Data Cables

33 EUR million average annual investments (last 5 years)

Sales in more than 46 countries

Established 1950

5 manufacturing plants in 3 countries

State of the art facilities

Telephone copper cables

Data transmission cables

Fiber optic cables

Instrumentation & control cables

Railway signalling & pilot cables

Telephone copper cables

Cable installation

- Indoor installation
- Installation in ducts
- Direct burial in the ground
- Self-supported with integral suspension element for aerial installations

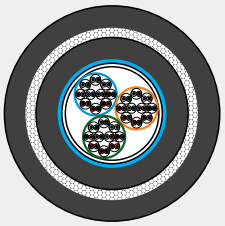
Cable types

- Conventional telephone cables
- High frequency and XDSL telephone cables
- Telephone switchboard cables
- Drop wires

Cable core

- Soft annealed/stranded copper conductors
- Solid/F-S/S-F-S/PE/PVC insulation for each conductor
- Cabling element of pairs/quads
- Stranding in layers or in sub-units and units
- Identification of pairs/quads by color coding &/or ring marking

Cable construction

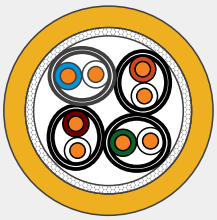


- Dry core/jelly-filled core
- Shielded/unshielded
- Armoured/unarmoured
- Single/double jacket
- PE/PVC/LSZH jacket

Cables compliant to international (IEC, VDE, BS EN, etc.) and to telecom operators standards (OTE, DEUTSCHE TELEKOM, ROM TELECOM, VODAFONE, etc.).

Customized and hybrid cables based on customer requirements (e.g. copper conductors & optical fibers in the same cable).

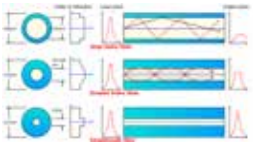
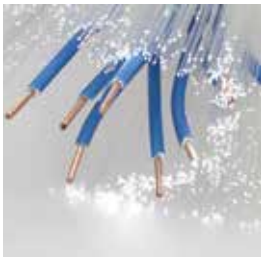
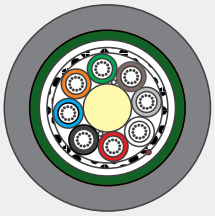
Data transmission cables

Cable types	Categories	Cable core	Cable Construction	Packing
				HELLENIC CABLES Member of CENERGY HOLDINGS 500 MHz TESTED!
• U/UTP • U/FTP (PiMF) • F/UTP • F/FTP • SF/UTP • S/FTP (PiMF)	• 5e (max 100MHz) • 6 (max 250 MHz) • 6A (max 500 MHz) • 7 (max 600 MHz) • 7A (max 1000 MHz) • 8 (higher frequencies)	• Soft annealed copper conductors • Conductor size: AWG 22/23/24 (based on cable category) • Solid/F-S/S-F-S PE insulation with colour coding • Stranding of conductors in pairs	• Individual screening per pair (PiMF) and/or overall screening • Overall screening: Al-PE foil with drain wire • PE/LSZH cross filler (CAT6 cables) • Braiding with copper wires (SF/UTP & S/FTP cables) • Sheath: PVC/LSZH/PE • Special constructions (steel tape/glass yarn armour etc.)	• Carton boxes: 305m • Plywood bobbins: 500m, 1000m • Wooden drums: 1000m, 2000m • Different packing options based on customer requirements

Cables compliant to IEC 11801, IEC 61156-5, IEC 61156-7, BS EN 50173-1 & EIA/TIA 568

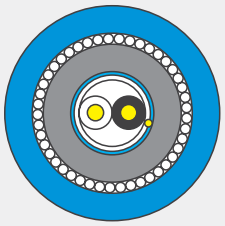
Fast growing portfolio following market needs (Categories 7A & 8 cables)

Fiber optic cables

Number of fibers	Type of fibers	Secondary coating	Cable types	Cable construction
				
• Max. 24 fibers per tube • Max. 16 tubes per layer • Max. 2 layers per cable • Max. 624 fibers per cable	• Single mode 9/125 LWP ITU-T G652D/ G657A1-A2 • Single mode 9/125 NZDS ITU-T G655D • Single mode 9/125 NZDS ITU-T G655E/G656 • Multi mode 62.5/125 OM1 • Multi mode 50/125 OM2, OM3, OM4, OM5	• Tight 900μm • Semi-tight 900μm • Loose of the appropriate size	• Aerial (ADSS & fig.8) • Underground, duct, dielectric or steel armored • Underground, direct buried, dielectric (glass) or steel armored • Indoor/outdoor, FR LSZH, dielectric (glass) or steel armored • Special FTTX constructions	• Inner sheath: PE, PVC, PBT, PA, PC, LSZH • Reinforcing: Steel, FRP, GYR, aramid • Armouring: FRP, CST, SWA, GYR • Sheath/Jacket: HDPE, PVC, LSZH, PA

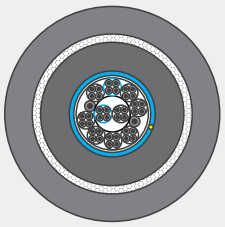
Cables compliant to international standards (ITU-T, IEC 60794, EIA/TIA 455, BS EN 18700, VDE 0888).

Control & instrumentation cables

Cable Types	Insulated Conductor	Cable Core	Cable construction
			
• Multipair PE insulated cables according to BS5308-1 • Multipair PVC insulated cables according to BS5308-2 and NF M87-202 • Multipair light current control cables according to ESI 09-6 • Wiring cables for telecommunication systems according to VDE 0812 & 0815	• Solid (Class 1), stranded (Class 2) or flexible (Class 5) copper conductors • Typical solid conductors diameter: 0.6/0.7/0.8/0.9 mm • Typical cross section for stranded conductors: 0.5/0.75/1/1.5/2.5 mm^2 • Insulation: PE/PVC/LSZH/XLPE • Conductor identification: colour coding/ring marking/numbered conductors	• Cabling elements of pairs/triads and stranding in concentric layers for BS5308 cables • Cabling elements of cores/ pairs and stranding in units/ concentric layers for VDE 0815 cables • Individually (IS) or collectively (CS) screened pairs/triads • Screening: AL-PE foil with a tinned copper drain wire	• Single jacket/double Jacket • Armoured/ unarmoured cables • Inner sheath: PE/PVC/LSZH • Braiding with copper wires • Armouring: steel wires, steel tapes

Cables with high-level electrical characteristics, compliant to international standards (VDE 0816-2, DB AG 416.0113-0116, RENFE E.T. 03.365.051.6, SNCF CT 445, NF F 55-698, BR 1932, BR 1932, BS EN 7870-8 etc.)

Railway signalling & pilot cables

Cable Types	Insulated Conductor	Cable Core	Cable construction
			
• Multicore/Multiquad Cables according to German DB Railway Standard • Balise cables customized • EAPSP, CCPSSP & CCTSST cables according to Spanish RENFE railway standard • ZPAU, ZPGU,ZPFU, ZCO3 cables according to French railway standard • Pilot cables acc. to BS EN 7870-8 & ENATS 09-6	• Soft annealed or stranded copper conductors • Typical solid conductors diameter: 0.64/0.9/1.2/1.3/1.4/1.8mm • Typical cross sections for stranded conductors:1.0/1.5/2.5mm^2 • Insulation: PE/PVC/LSZH • Conductor Identification: colour coding and/or ring marking	• Dry core cables or jelly-filled cables • Cabling elements: cores/pairs/ quads • Stranding of cabling elements in concentric layers • Wrapping: - PE foil (for dry cables) - Paper tape (for filled cables) - Water blocking tape	• Inner sheath: PE/PVC/LSZH • Induction protection: AL-PE tape, copper tape, copper wire • Armouring: steel tape, steel wires • Outer sheath: PE/PVC/LSZH • Different constructions based on reduction factor and fire rating of the cable

Cables with high-level electrical characteristics, compliant to international standards (VDE 0816-2, DB AG 416.0113-0116, RENFE E.T. 03.365.051.6, SNCF CT 445, NF F 55-698, BR 1932, BR 1932, BS EN 7870-8 etc.).

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Member of CENERGY HOLDINGS

www.hellenic-cables.com

HEAD OFFICE:

33, Amaroussiou - Halandriou Str., 151 25 Maroussi, Athens, GREECE
Tel.: +30 210 6787 416, +30 210 6787 900
Fax: +30 210 6787 406
e-mail: info@hellenic-cables.com

PRODUCTION PLANTS:

Corinth
Submarine Cables Plant
Soussaki, P.O. 11, 201 00
Corinth, GREECE
Tel.: +30 27410 48401
Fax: +30 27410 48392

Thiva
Cables Plant
69th km Athens-Thiva
Old National Road,
Agios Tryphonas, 32 200
Thiva, GREECE
Tel.: +30 22620 86616
Fax: +30 22620 86606

ICME ECAB
Cables & Compounds Plant
42, Drumul intre
Tarlale Str. 3rd sector,
032982, Bucharest, ROMANIA
Tel.: +40 21 2090200
Fax: +40 21 2561476

SALES OFFICES:

Hellenic Cables America Co.
750 Town and Country, Blvd Ste 675,
Houston, TX 77024, USA
Tel.: +1 (281) 752-7333

METAL AGENCIES
Suite 4, Cobb House, 2-4
Oyster Lane, Byfleet, Surrey
KT14 7DU, UNITED KINGDOM
Tel.: +44 1932 33 11 38
Fax: +44 1932 33 11 90

GENECOS S.A.
19 Rue de Passy,
750 16 Paris, FRANCE
Tel.: +33 14527 0754
Fax: +33 14527 0708

TEPRO METAL Vertriebs GmbH
Ursulastrasse 33-41, D-50354,
Hurth, GERMANY
Tel.: +49 2233 39621 11
Fax: +49 2233 39621 90