With a wide portfolio of reliable and competitive cable solutions for international customers, the Cablel Hellenic Cables Group is one of the largest cable producers in Europe. The Group manufactures power, telecommunication and submarine cables, as well as enamelled wires and compounds.

The Cablel Hellenic Cables Group represents the cable production and marketing sector of Viohalco SA. 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, the Cablel Hellenic Cables Group consists of Hellenic Cables S.A. which operates three plants in Viotia, Greece that produce cables, enamelled wires 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; Irioe 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 export orientation and focus on development of value added products, such as high and extra-high voltage cables and submarine cables, the Group implements significant investments towards enriching its product portfolio and enhancing its sustainability profile. The Company implemented a EUR 60 million approximately investment plan for the manufacture of high-voltage submarine cables in Fulgor’s plant.

The Company’s wide product range, which is sold internationally under the Cablel® trademark, extends to PVC, EPR and XLPE insulated power cables (rated up to 500 kV), 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 and enamelled wires. Wires and cables are supplied to a variety of international standards, such as VDE, CEE, IEC, NF, SEN, BS, UL, NEMA, JIS, ASTM, DIN and ELOT. Many of the Company’s products are certified by BASEC, VDE, IMQ, NF-USE, NETWORKRAIL, KEMA, DNV and UL.

All Cablel® enamelled wires are manufactured and tested to the IEC 60317-0-1 standard; customers may also request any other recognised international standard.

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 9001:2008, its Environmental Management System to ISO 14001:2004 and its Occupational Health and Safety to OHSAS 18001:2007. Cablel Hellenic Cables Group 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 Cablel Hellenic Cables Group 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 Cablel® products have made a reliable choice.

The Cablel Hellenic Cables Group 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 Group 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 Group plans additional investments in technology and innovative cable solutions, as a way of contributing to the creation of a sustainable future for its stakeholders.
Low Voltage Power Cables

Power cables for fixed installation, indoors, outdoors and in ground.

**Rated voltage:** $U_{0} / U = 0.6 / 1 \text{ kV} \ (U_{m} = 1.2 \text{ kV})$

**Construction**

1. **Conductor:**
   - U: Circular single wire copper conductors
   - R: Round stranded copper conductors
   - AR: Circular, stranded aluminum conductors
   - AS: Compressed annealed sector-shaped aluminum conductors

2. **Insulation:** XLPE

3. **Stranding:** Cores laid up together

4. **Sheath:** Black weather resistant halogen-free flame-retardant (PE)

**Cross-section range:**
- SE-NIXE-U: 4G10; 5G10
- SE-NIXE-R: 4G18; 5G16
- SE-NIXE-AR: 5G16; 5G25
- SE-NIXE-AS: 4G25; 6G50; 4G95; 4G150; 4G240

**Core Identification:** Color code acc. HD 308 S2

**Maximum operating temperature**
- In continuous operation: 90°C
- Conductor (max. 5 s): 250°C
- When laying: -20°C

**Lowest cable temperature**
- Flame retardant

**Minimum bending radius**
- During installation, 12 x D - Installed 8 x D

**Standards:**
- HD 603-50 S1, IEC 60502-1, IEC 60228

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Power cables: FR-N1XV-U/ R (U-1000 R2V) 0,6/1 kV

FR-N1XV (U-1000 R2V) are power and building cables that can be used in all types of low-voltage electrical industrial and building installations. They can be installed in all types of environments indoors and outdoors, directly on the wall, on cable trays, in installation ducts, pipes and soil and water.

**Rated voltage:** $U_{00} / U = 0.6 / 1 \text{ kV} \ (U_{m} = 1.2 \text{ kV})$, Test voltage 4000V, 50Hz

**Construction**

1. **Conductor:**
   - U: 1.5 to 2.5 mm² solid round wires
   - R: 1.5 to 50 mm² round stranded copper conductors

2. **Insulation:** XLPE

3. **Filler:** Extruded compound

4. **Sheath:** Black lead-free PVC

**Cross-section range:**
- FR-N1XV-U: 3G1.5; 3G2.5; 4G1.5; 4G2.5; 5G1.5; 5G2.5
- FR-N1XV-R: 3G6; 4G6; 4G10; 4G16; 4G25; 4G35; 4G50; 5G6; 5G10; 5G16; 5G25

**Core Identification:** Color code acc. HD 308 S2

**Maximum operating temperature**
- In continuous operation: 90°C
- Conductor (max. 5 s): 250°C
- When laying: -15°C

**Lowest cable temperature**
- Flame retardant

**Minimum bending radius**
- During installation, 12 x D - Installed 8 x D

**Standards:**
- IEC 60502-1, IEC 60228, NF C 32-321
LOW VOLTAGE POWER CABLES

Halogen-free power cables for fixed installation, indoors and outdoors. FXQJ are LSZH cables (Low Smoke Zero Halogen) In case of a fire they do not emit corrosive gases or dense fumes.

Rated voltage: \( U_{0} / U = 0.6 / 1 \) kV (\( U_{m} = 1.2 \) kV)

Construction

1. Conductor: 16 mm² round annealed stranded copper conductors (-R)
2. Stranding: 3 phases and neutral conductor laid-up together
3. Concentric conductor: Copper wires with opposite open helix tape
4. Sheath: Black halogen-free compound polyolefin
5. Color code acc. HD 308 S2

Cross-section range:
- 4x16/16, 4x25/16, 4x35/16, 4x50/25
- 4x70/35, 4x95/50, 4x120/70, 4x150/70
- 4x185/95, 4x240/120

Cable marking: Manufacturer, product name, number of cores x size, date of manufacture, material of the sheath, meter marking

Standards: IEC 60502-1, HD 604-51, IEC 60754-1, -2, IEC 61034-1, -2

LOW VOLTAGE POWER CABLES

Halogen-free power cables for fixed installation, indoors and outdoors. AXQJ are LSZH cables (Low Smoke Zero Halogen) In case of a fire they do not emit corrosive gases or dense fumes.

Rated voltage: \( U_{0} / U = 0.6 / 1 \) kV (\( U_{m} = 1.2 \) kV)

Construction

1. Conductor: Compressed annealed aluminum sector-shaped conductor (-AS)
2. Conductor: Copper wires with opposite open helix tape
3. Sheath: Black halogen-free compound polyolefin

Cross-section range:
- 4x25/16, 4x50/16, 4x70/21, 4x95/29
- 4x120/41, 4x150/57, 4x185/72

Cable marking: Manufacturer, product name, number of cores x size, date of manufacture, material of the sheath, meter marking

Standards: IEC 60502-1, HD 604-51, IEC 60754-1, -2, IEC 61034-1, -2
Cables specially designed to be installed in all areas that require special protection of people when a fire situation could create a major hazard, especially in public buildings such as commercial centres, hospitals, hotels, buildings of offices, tunnels, etc. RZ1-K are LSZH cables (Low Smoke Zero Halogen). In case of a fire they do not emit corrosive gases or dense fumes. Suitable for flexible connections for motors, generators.

**Rated voltage:** $U_0 / U = 0.6 / 1$ kV $(U_{m} = 1.2$ kV$)$, Test voltage 3500 V a.c. for 5s.

**Cable marking:** Manufacturer, product name, number of cores x size, date of manufacture, meter marking.

**Standards:**
- IEC 60502-1
- Fire retardant EN 60332-3-24 / IEC 60332-3-24
- Flame retardant: EN 60332-1 / IEC 60332-1
- Halogen free EN 60754-1 / IEC 60754-1
- Low smoke EN 61034 / IEC 61034
- Low corrossivity EN 60754-2 / IEC 60754-2
- Lead Free

**Construction**
1. **Conductor:** Flexible bare copper Class 5, acc. to IEC 60228
2. **Insulation:** Cross-linked polyethylene XLPE, Type DIX 3
3. **Sheath:** Black halogen-free compound polyolefin

<table>
<thead>
<tr>
<th>Core Identification</th>
<th>Color code acc. HD 308 S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable range</td>
<td>1 core 1.5 - 630 mm² Also available as 3/4/5 cores</td>
</tr>
<tr>
<td>Maximum operating temperature</td>
<td>Lowest cable temperature</td>
</tr>
<tr>
<td>In continuous operation: 90°C Conductor (max. 5 s): 250°C</td>
<td>When laying: -5°C</td>
</tr>
<tr>
<td>Temperature range</td>
<td>Fire retardant</td>
</tr>
<tr>
<td>Fixed: -25°C to +90°C</td>
<td>IEC 60332-3-24 (F4C)</td>
</tr>
<tr>
<td>Test voltage 3500 V a.c. for 5s.</td>
<td></td>
</tr>
</tbody>
</table>

Halogen-free power cables: RXL Plus-F2, 0.6/1 kV

Specially designed cables to be installed in all areas that require special protection of people. RXL Plus-F2 are LSZH cables (Low Smoke Zero Halogen). In case of a fire they do not emit corrosive gases or dense fumes. To be used outdoors and indoors for connection to transformers, etc.

**Rated voltage:** $U_0 / U = 0.6 / 1$ kV $(U_{m} = 1.2$ kV$)$, Test voltage 3500 V a.c. for 5s.

**Cable marking:** Manufacturer, product name, number of cores x size, date of manufacture, meter marking.

**Standards:**
- HD 603
- Flame retardant EN 60332-1 / IEC 60332-1
- Halogen free EN 60754-1 / IEC 60754-1
- Low smoke EN 61034 / IEC 61034
- Low corrossivity EN 60754-2 / IEC 60754-2
- Lead Free

**Construction**
1. **Conductor:** Stranded circular compacted aluminium Class 2, acc. to IEC 60228
2. **Insulation:** Cross-linked polyethylene XLPE, Type DIX 3
3. **Sheath:** Flame retardant PE sheath black Type DMO1 acc. to HD 603-1

<table>
<thead>
<tr>
<th>Core Identification</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Cable range</td>
<td>1 core 1.5 - 630 mm²</td>
</tr>
<tr>
<td>Maximum operating temperature</td>
<td>Lowest cable temperature</td>
</tr>
<tr>
<td>In continuous operation: 90°C Conductor (max. 5 s): 250°C</td>
<td>When laying: -15°C</td>
</tr>
<tr>
<td>Temperature range</td>
<td>Fire retardant</td>
</tr>
<tr>
<td>Fixed: -40°C to +70°C</td>
<td>IEC 60332-1-2 (F2)</td>
</tr>
<tr>
<td>Test voltage 3500 V a.c. for 5s.</td>
<td></td>
</tr>
</tbody>
</table>
Low voltage power cables

Rubber flexible cables for use in dry, humid or moist rooms, in open air. In workshops having an explosive atmosphere for medium mechanical stresses. In industrial and agricultural workshop appliances, heating installations, inspection lamps, electric tools such as drills, circular saws, domestic electric tools and also in agricultural workings. Used for transportable motors or machines on building sites. Oil and chemical resistant outer sheath.

- **Rated Voltage:** U0 / U = 450/750 V

- **Cross-section range:** 1 core: 1.5 - 630, 2 cores: 1 - 95, 3 cores: 1 - 300, 4 cores: 1 - 240, 5 cores: 1 - 240, 5 - 37 cores: 1.5, 6 - 37 cores: 2.5, 8 - 18 cores: 4

- **Core Identification:** Color code acc. HD 308 S2

- **Maximum Operating Temperature:** Minimum application temperature

- **Conductor:** Flexible annealed copper conductors Class 5
- **Insulation:** EP rubber
- **Sheath:** Black synthetic rubber (equivalent polychloroprene)

- **Maximum Bending Radius:** Flame retardant

- **4 x D installed:** IEC 60332-1-2 (F2)

- **Certifications:** ELVT <HAR>

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Low voltage power cables

Halogen-free cables with intrinsic fire resistance based on VDE 0266 and HD 604 S1. Specially designed to be installed in all areas that require special protection of people and equipment against fire and fire damages and where strict security requirements must be fulfilled. Suitable for indoor applications. For outdoor applications, protection must be provided against exposure to direct sunlight. They can be laid in earth or water only in protective conduits. These cables correspond to the demands of System Circuit Integrity E90* in accordance with DIN 4102-12.

- **Rated Voltage:** U0 / U = 0.6 / 1 kV (Ulm = 1.2 kV)

- **Core Identification:** Color code acc. HD 308 S2

- **Maximum Operating Temperature:** Operating temperature

- **In continuous operation:** 90°C

- **Conductor (max. 5 s):** 250°C

- **Sheath:** Flame retardant Polyolefin thermoplastic compound, acc. to VDE 0276-604 "Hm4".

- **Sheath colour:** Orange

- **Certifications:** VDE

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Notes:
- * System Circuit Integrity is dependent on installation method.
Three-core cable with aluminium round solid or stranded compacted conductors, XLPE insulation, screen of aluminium wires, aluminium laminate tapes, polyethylene oversheath.

**Rated voltage Uo/U (Umax):** 6/10 (12) kV – 12/20 (24) kV – 18/30 (38) kV

**Standard specification:** HD 620/10-M

1. **Conductor:**
   Aluminium round solid class 1 or Aluminium round stranded compacted class 2 EN 60228 longitudinally waterblocked by waterblocking yams and/or waterblocking tapes between conductor inner strands

2. **Conductor non-metallic extruded screen:**
   Extruded semiconducting compound

3. **Insulation:**
   XLPE tree-retardant type DIX 11 according to HD 620-10M
   Nominal thicknesses of insulation according to HD 620-10M

4. **Core non-metallic extruded screen:**
   Extruded semiconducting compound bonded to insulation
   Core identification by printing PHASE 1, PHASE 2, PHASE 3 by ink on the surface of the extruded semiconductive screen

5. **Pilling material in the interstices in order to achieve the triangular shape**

6. **Semiconductive waterblocking tape applied helically with overlap**

7. **Metallic screen:**
   Aluminium wires helically applied over the assembly of cores

8. **Semiconductive waterblocking tape applied helically with overlap**

9. **Radial watertightness:**
   Two Al/PE laminated tapes bonded to oversheath helically applied

10. **Sheath:**
    HDPE type DMP10 according to HD 620-10M
    Nominal thicknesses of oversheath according to HD 620-10M

<table>
<thead>
<tr>
<th>Range of 1-core Cross Section</th>
<th>10kV</th>
<th>20kV</th>
<th>30kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-300mm²</td>
<td>10-240mm²</td>
<td>50-240mm²</td>
<td></td>
</tr>
</tbody>
</table>

The cable contains two Kevlar tear threads for the removal of the outer sheath.
Three-core cable with aluminium round stranded or solid conductors, XLPE insulation, screen of copper wires, polyethylene oversheath, LSF layer.

**Rated voltage Uo/U (Umax):** 6/10 (12) kV – 12/20 (24) kV – 18/30 (36) kV

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**Standard specification:**

Generally according to HD 620-10M, IEC 60332-1

1. **Conductor:**
   - Aluminium round solid class 1 or Aluminium round stranded compacted class 2 EN 60228 longitudinally waterblocked by waterblocking yarns and/or waterblocking tapes between conductor inner strands

2. **Conductor non-metallic extruded screen:**
   - Extruded semiconducting compound

3. **Insulation:**
   - XLPE tree-retardant type DIX 11 according to HD 620-10M
   - Nominal thicknesses of insulation according to HD 620-10M

4. **Core non-metallic extruded screen:**
   - Extruded semiconducting compound bonded to insulation
   - Core identification by printing PHASE 1, PHASE 2, PHASE 3 by ink on the surface of the extruded semiconductive screen

5. **Filling material in the interstices in order to achieve the triangular shape**

6. **Semiconductive waterblocking tape applied helically with overlap**

7. **Metallic screen:**
   - Copper wires helically applied over the assembly of cores

8. **Semiconductive waterblocking tape applied helically with overlap**

9. **Sheath:**
   - HDPE type DMP10 according to HD 620-10M
   - Nominal thicknesses of oversheath according to HD 620-10M

10. **Flame retardant layer:**
    - LSF layer for providing flame retardance according to IEC 60332-1

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<table>
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<th>10kV</th>
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<td>10–240mm²</td>
<td>50–240mm²</td>
<td></td>
</tr>
</tbody>
</table>

The cable contains two Kevlar tear threads for the removal of the outer sheath.
Three-core cable with copper round stranded conductors, XLPE insulation, screen of copper wires, polyethylene oversheath, LSF layer.

**Rated voltage Uo/U (Umax):** 6/10 (12) kV – 12/20 (24) kV – 18/30 (38) kV

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**Standard specification:**
Generally according to HD 620-10M, IEC 60332-1

1. **Conductor:**
   Copper round stranded compacted class 2 EN 60228 (optional: longitudinally waterblocked by waterblocking yarns and/or waterblocking tapes between conductor inner strands)

2. **Conductor non-metallic extruded screen:**
   Extruded semiconducting compound

3. **Insulation:**
   XLPE tree-retardant type DIX 11 according to HD 620-10M
   Nominal thicknesses of insulation according to HD 620-10M

4. **Core non-metallic extruded screen:**
   Extruded semiconducting compound bonded to insulation
   Core identification by printing PHASE 1, PHASE 2, PHASE 3 by ink on the surface of the extruded semiconductive screen

5. **Filling material in the interstices in order to achieve the triangular shape

6. **Semiconductive waterblocking tape applied helically with overlap

7. **Metallic screen:**
   Copper wires helically applied over the assembly of cores

8. **Semiconductive waterblocking tape applied helically with overlap

9. **Sheath:**
   HOPE type OMP10 according to HD 620-10M
   Nominal thicknesses of oversheath according to HD 620-10M

10. **Flame retardant layer:**
    LSF layer for providing flame retardance according to IEC 60332-1

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**Range of 1-core Cross Section**

<table>
<thead>
<tr>
<th></th>
<th>10kV</th>
<th>20kV</th>
<th>30kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>10-300mm²</td>
<td>10-240mm²</td>
<td>50-240mm²</td>
</tr>
</tbody>
</table>

The cable contains two Kevlar tear threads for the removal of the outer sheath.
Single-core cable with aluminium solid or round compacted conductor, XLPE insulation, copper wire screen, polyethylene oversheath.

Rated voltage Uo/U (Umax): 6/10 (12) kV – 12/20 (24) kV – 18/30 (38) kV

Standard specification: HD 620-10M

1. Conductor:
   Aluminium round solid class 1 or Aluminium round stranded compacted class 2 EN 50228 longitudinally waterblocked by waterblocking yarns and/or waterblocking tapes between conductor inner strands

2. Conductor non-metallic extruded screen:
   Extruded semiconducting compound

3. Insulation:
   XLPE type DIX 11 according to HD 620-10M
   Nominal thickness of insulation according to HD 620-10M

4. Core non-metallic extruded screen:
   Extruded semiconducting compound bonded to insulation

5. Semiconductive waterblocking tape applied helically with overlap

6. Metallic screen:
   Copper wires helically applied over core and wrapped with a copper tape laid in open helix

7. Semiconductive waterblocking tape applied helically with overlap

8. Radial watertightness:
   AL/PE laminated tape bonded to oversheath, longitudinally applied with overlap

9. Sheath:
   HDPE type DMP10 according to HD 620-10M
   Nominal thickness of sheath according to HD 620-10M

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<td>50-240mm²</td>
<td></td>
</tr>
</tbody>
</table>

The cable contains two Kevlar tear threads for the removal of the outer sheath.
Single-core cable with round copper or aluminium/stranded or solid conductors, XLPE insulation, screen of copper wires, polyethylene oversheath.

**Standard specification:** IEC 60840, IEC 62067

1. **Conductor:**
   Aluminium round solid class 1 or Aluminium round stranded compacted class 2 EN 50228 longitudinally waterblocked by waterblocking yarns and/or waterblocking tapes and/or waterblocking powder between conductor inner strands

2. **Conductive tape applied helically with overlap (optional)**

3. **Conductor non-metallic extruded screen:**
   Extruded semiconducting compound

4. **Insulation:**
   XLPE super-clean according to IEC 60840

5. **Core non-metallic extruded screen:**
   Extruded semiconducting compound bonded to insulation

6. **Conductive waterblocking tape applied helically with overlap**

7. **Metallic screen:**
   Copper wires helically applied over core and wrapped with a copper tape laid in open helix

8. **Conductive waterblocking tape applied helically with overlap**

9. **Radial watertightness:**
   AL/PE laminated tape bonded to oversheath, longitudinally applied with overlap

10. **Sheath:**
    HDPE type ST7 according to IEC 60840

11. **Extruded semiconducting compound serving as electrode for the DC voltage test of the oversheath.**