Reach into the Future with Hexatronic Submarine Cable Systems

Originating from the former Ericsson cables operations, Hexatronic has extensive experience within submarine cable manufacturing and installation. With a renowned Swedish quality and competence, we know how to deliver submarine cable systems designed to withstand the toughest conditions.

The Hexatronic Submarine Cable Systems offering covers all aspects related to submarine cabling from the central office, land section to the beach manhole and crossing under the sea.

Hexatronic supports your project from start to finish, to ensure reliable subsea cable operations, that will connect people and places for generations to come.

**Hexatronic Submarine Cable at a glance:**
- Designed for depths down to 3000 m
- With or without enhanced toning or electrodoping capabilities
- Loose tube or slotted core ribbon options
- Superior mechanical and water blocking properties

For a wider selection of products from Hexatronic Cables & Interconnect Systems, please refer to the main catalogue Fiber Solutions for Access and Transport Networks or visit www.hexatronic.com

Contact the Hexatronic sales team to find your nearest wholesaler +46 (0) 10 - 453 02 00, order@hexatronic.com

**ONLINE CATALOGUE**

For the digital catalogue and more information about our products and services, please visit hexatronic.com

Hexatronic’s catalogues are also available online at issuu: issuu.hexatronicpartners.se
Building the Networks of the World

Connecting people and places and transferring huge amounts of information at extremely high speed, is what makes the world go round. Hexatronic provides the life-line that connects continents, countries and islands, on the land and under the sea.

Extensive knowledge and experience
With a distinguished history of over 25 years, originating from Ericsson, Hexatronic has a unique knowledge and solid experience. Worldwide submarine cable projects include design, manufacturing, project management and installation. The focus is on providing cost effective, time saving installations, with the ability to customize according to the specific requirements.

Complete turn-key solutions
Hexatronic offers complete solutions for submarine cables and the entire passive fiber infrastructure based on scalable and future-proof technology.

Hexatronic Cables & Interconnect Systems offers:
• Over 25 years of experience with references from all over the world
• Swedish quality and technical proficiency
• Total turn-key solutions for the entire passive fiber infrastructure
• High quality optical fibers from world-leading producers
Hexatronic Submarine Systems
Global References

Hexatronic has extensive experience in worldwide submarine cable projects. Our references include a range of different needs and solutions. Here is a selection of a few installation types.

The Baltic Sea Projects
CABLE TYPE: Ribbon
PROJECT: Supply of submarine cables and accessories

C.A.T. Thailand Project
CABLE TYPE: Ribbon
PROJECT: Turn-key

Philippines, Globe Telecom Project
CABLE TYPE: Loose tube
PROJECT: Turn-key

ADONES - The Angola Domestic Network System Project
CABLE TYPE: Loose tube
PROJECT: Turn-key

The North Sea Project
CABLE TYPE: Ribbon
PROJECT: Turn-key

NordBalt Project
CABLE TYPE: Loose tube
PROJECT: Supply of submarine cables and accessories, services
**Submarine Cable Design**

To ensure fiber optic cables have a long life span, Hexatronic’s submarine cables are built to offer the best protection from water ingress and potential damage.

Two basic designs are used: loose tube or slotted core. The loose tube design is based on fibers protected in a hermetical stainless steel tube. The slotted core design incorporates fibers arranged in ribbons. The slotted core is protected in a copper tube.

A polyethylene sheath and one or two layers of steel wire armoring is used to provide high tensile strength and good mechanical protection. The cables are armored depending on where they are going to be installed. Double armored (DA) cables are installed in shallow water with depths of 0 to 500 m. Most commonly the DA cables are installed no deeper than 200 m. For depths greater than 500 m the single armored (SA) cable is used. An outer sheath, normally made of high tensile polypropylene yarn wrapped around the armoring facilitate the handling of the cable during installation.

The product range comprises of cables and joints for depths down to 3 000 m. All loose tube cables are designed for both Universal Joint (UJ) and Universal Quick Joint (UQJ) qualification and are offered with or without enhanced-toning and electroding capabilities. Electroding allows the cable to be detected and tracked. This facilitates locating the cable if it has been broken or an object on the seabed has moved it.
Hexatronic’s loose tube cables provide superior mechanical protection, easy handling and reliable performance. All cables have steel wire armoring in one or several layers and/or stainless steel tube to provide the highest protection and water blocking properties. The cables are resistant to tensile forces and impact caused by anchoring, recovery operations and handling. All loose tube cables and joints are built with the highest quality protection to ensure a long life span for maximum efficiency over long distances.

### Single Armored

**TOL 404 1050 GJMLTV, 10-ton SA**

Single-armed, unitube cable where moderate protection is required in submarine applications. This design includes a hermetically sealed stainless tube (3.7 mm outer diameter). Inside the tube the fibers are free to move in the thixotropic water blocking compound. The tube is protected by a polyethylene sheath, one layer of galvanized steel wires and wrapped in a layer of polypropylene yarn.

The unitube technique results in a high packing density. This permits a small outer diameter and easy handling.

**Design:** Loose tube, single armor  
**Type:** 10 ton, ≤ 3000 m  
**Capacity:** 12 - 96 fibers

### Double Armored

**TOL 404 1051 GJMLTV, 15-ton DAL**

Double-layer armored, unitube cable where high protection is required in submarine applications. This design includes a hermetically sealed stainless tube (3.7 mm outer diameter). Inside the tube the fibers are free to move in the thixotropic water blocking compound. The tube is protected by a polyethylene sheath, two layers of galvanized steel wires and wrapped in a layer of polypropylene yarn.

**Design:** Loose tube, double armor  
**Type:** 15 ton, ≤ 3000 m  
**Capacity:** 12 - 96 fibers

**TOL 404 1062 GJMLTV, 25-ton DA**

Double-layer armored, unitube cable with the same principal design as the GJMLTV, 15-ton DA.  
**Design:** Loose tube, double armor  
**Type:** 25 ton, ≤ 3000 m  
**Capacity:** 12 - 96 fibers
| **TOL 404 1054 GJMLTV, 40-ton DA** | Double-layer armored with the same principal design as the GJMLTVs, 15-ton DA.  
**DESIGN:*** Loose tube, double armor  
**TYPE:** 40 ton, ≤ 3000 m  
**CAPACITY:** 12 - 96 fibers |
|---|---|

**Electroding / Toning – Single Armored**

| **TOL 404 1080 GJMLTV, 10-ton SA** | Double-layer armored with the same principal design as the GJMLTV, 10-ton DA. The cable incorporates a copper layer wrapped around the stainless tube for electroding and toning.  
**DESIGN:*** Loose tube, single armor, electroding  
**TYPE:** 10 ton, ≤ 3000 m  
**CAPACITY:** 12 - 96 fibers |

| **TOL 404 1082 GJMLTV, 25-ton DA** | Double-layer armored with the same principal design as the GJMLTV, 25-ton DA. The cable incorporates a copper layer wrapped around the stainless tube for electroding and toning.  
**DESIGN:** Loose tube, double armor, electroding  
**TYPE:** 25 ton, ≤ 3000 m  
**CAPACITY:** 12 - 96 fibers |

| **TOL 404 1083 GJMLTV, 40-ton DA** | Double-layer armored with the same principal design as the GJMLTV, 15-ton DA.  
**DESIGN:** Loose tube, double armor, electroding  
**TYPE:** 40 ton, ≤ 3000 m  
**CAPACITY:** 12 - 96 fibers |

**Submarine Joints for Loose Tube Cables**

| **NCD 601 0014 Submarine Joint Closure** | Closure made of heavy-duty stainless steel and hermetically sealed cable joints for loose tube fiber optic submarine cables. The joint can host up to 48 fibers.  
**DESIGN:** Straight joint for GJMLTV  
**CAPACITY:** 1 - 48 fibers |

| **NCD 601+ Universal Joint for Submarine Cables** | Universal Joint is a technology developed by the Universal Joint Consortium to facilitate efficient maintenance of installed submarine cable systems. Most of Hexatronic’s submarine cables are qualified for this technology and for some cable types this joint type is used in installation projects of new systems.  
**DESIGN:** UJ for 10-, 25-, 40 ton submarine cables  
**CAPACITY:** 1 - 96 fibers |
### General Data – Loose Tube Cables

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<thead>
<tr>
<th>Product Name</th>
<th>Fiber No.</th>
<th>Fiber Type</th>
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### Product Information – Loose Tube Cables

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*where xx = fiber count (12-, 24-, 48-)

### General Data – Loose Tube Cables

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Hexatronic’s ribbon cables offer high packing density and efficient fiber management as well as high protection for fiber in the harsh conditions under the sea. Exceptional mechanical and water blocking properties are provided by a slotted cable core design, protected by a copper tube and with steel wire armoring. This combination has a good resistance to crushing and heavy impacts, such as anchoring, recovery operations or manhandling. Protection from the water is achieved by the copper tube acting as a water barrier.

The cable core is also filled with a water repelling compound for extra reassurance. The cable design enables extremely long delivery length with a minimum number of bulky joint closures.

**Single Armored**

**TOL 404 1010 and TOL 404 1038 GASLMLTV Submarine Cables 5 ton SAL Single Armored**

GASLMLTV, 5-ton SAL is a single armored light fiber ribbon cable for submarine installations where light to moderate protection is required. This submarine cable is based on our well-proven 4- or 8-fiber ribbon cable design. Added on to the inner PE-jacket is a waterproof copper tube, followed by a second outer polyethylene jacket and a layer of galvanized steel wires. The complete cable is wrapped with a layer of polypropylene yarn.

**DESIGN:** Slotted core ribbon, single armor  
**TYPE:** 5 ton, ≤ 500 m  
**CAPACITY:** 12 - 192 fibers

**TOL 404 1016 and TOL 404 1039 GASLMLTV Submarine Cables 10 ton SA Single Armored**

Single-layer armored with the same principal design as the GASLMLTV, 5-ton SAL.

**DESIGN:** Slotted core ribbon, single armor  
**TYPE:** 10 ton, ≤ 500 m  
**CAPACITY:** 12 - 192 fibers

**TOL 404 1023 and TOL 4040 1040 GASLMLTV Submarine Cables 15 ton SAH Single Armored**

Single-layer armored with the same principal design as the GASLMLTV, 5-ton SAL.

**DESIGN:** Slotted core ribbon, single armor  
**TYPE:** 15 ton, ≤ 500 m  
**CAPACITY:** 12 - 192 fibers
Double Armored

**TOL 404 1011 and TOL 404 1024 GASLMLTV Submarine Cables 20 ton DA Double Armored**

GASLMLTV, 20-ton DA is a double armored fiber ribbon cable for submarine installation where high protection is required. This submarine cable is based on our well-proven 4- or 8- fiber ribbon cable design. Added on to the inner PE-jacket is a waterproof copper tube, followed by a second outer polyethylene jacket and two layers of galvanized steel wires. The complete cable is wrapped with a layer of polypropylene yarn.

**Design:** Slotted core ribbon, double armor  
**Type:** 20 ton, ≤ 500 m  
**Capacity:** 12 - 192 fibers

**TOL 404 1002 and TOL 404 1042 GASLMLTV Submarine Cables 40 ton DAH Double Armored**

Double-layer armored with the same principal design as the GASLMLTV, 20-ton DA.

**Design:** Slotted core ribbon, double armor  
**Type:** 40 ton, ≤ 500 m  
**Capacity:** 12 - 192 fibers

Rock Armored

**TOL 404 1043 and TOL 404 1041 GASLMLTV Submarine Cables 20 ton RA Rock Armored**

The GASLMLTV, 20-ton RA is a rock armored fiber ribbon cable for submarine installation in areas where the cable is exposed to severe mechanical wear and tear. For example, installation direct on rock or shore landings where the cable is hit by forces from waves and tides. This submarine cable is based on our well-proven 4- or 8-fiber ribbon cable design. Added on to the inner PE-jacket is a waterproof copper tube, followed by a second outer polyethylene jacket and a triple layer of galvanized steel wires. The complete cable is wrapped with a layer of polypropylene yarn.

**Design:** Slotted core ribbon, triple armor, rock  
**Type:** 20 ton, ≤ 500 m  
**Capacity:** 12 - 192 fibers

Submarine Joints

**NCD 601 0010 and 0008 Submarine Cable Joint**

The NCD 601 joint is designed for jointing of Hexatronic fiber optic submarine cables, maintaining the mechanical, optical and electrical properties of the cable.

The joint closure is made of corrosion resistant stainless steel alloy. The watertight outer housing provides the mechanical strength and protection. An inner sealed box contains the fiber organizers and can accommodate splice sleeves for up to 96 fibers in the NCD 601 0010 model and up to 192 fibers in the NCD 601 0008 model.

NCD 601 0010 is designed for 4-fiber ribbon submarine cables.  
NCD 601 0008 is designed for 8-fiber ribbon submarine cables.

**Design:** Straight joint for GASLMLTV  
**Capacity:** 1 - 192 fibers
## General Data – Ribbon Submarine Cables

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<th>Operation</th>
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<th>Installation</th>
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## Product Information – Ribbon Submarine Cables

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</tbody>
</table>

*where xx = fiber count (12-, 24-, 48-)

## Product Information – Ribbon Submarine Cable Joints

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Product Name</th>
<th>Fiber No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCD6010000D</td>
<td>Straight Joint for GASLMLTV</td>
<td>12-96</td>
</tr>
<tr>
<td>NCD6010000B</td>
<td>Straight Joint for GASLMLTV</td>
<td>96-192</td>
</tr>
</tbody>
</table>

*UJ for GASLMLTV | 12-96
Throughout our history of supplying high quality, reliable cable solutions, we have developed a long track record with leading power cable suppliers. Fiber optic submarine cable parts for integration into power cables, enables global suppliers to meet the growing need for more power over greater distances.

Cable up to 24 km can be installed without a factory joint. Cables that are longer than 24 km require factory joints. Repair joints can also be provided.

Hexatronic has delivered more than 3 000 km of fiber optic cable parts for hybrid cables, to well known cable suppliers worldwide.

The hybrid cables are used in different parts of the power grid. In most cases the hybrid cables are connections to offshore wind farms, offshore oil and gas platforms or interconnect cables for power utilities.
**GJMLV Submarine Optical Cable Part 12-96 Fibers**

The cable part is based on a hermetically sealed stainless tube of 3.7mm outer diameter. Inside the tube the fibers are free to move in thixotropic water blocking compound. The steel tube is protected by a semiconductive polyethylene sheath. The fibers are easy to identify due to color and colored yarns. The cable part is designed to be integrated in submarine electrical power cables.

**DESIGN:** Loose tube  
**TYPE:** For integration, ≤ 3000 m  
**CAPACITY:** 12 - 96 fibers

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**GASLMLV Submarine Optical Cable Part 12-192 Fibers, Ribbon**

This submarine cable part is based on our well-proven 4- or 8- fiber ribbon cable design. Added on to the inner polyethylene jacket is a waterproof copper tube, followed by a second outer semiconductive polyethylene jacket.

**DESIGN:** Slotted core ribbon  
**TYPE:** For integration, ≤ 500 m  
**CAPACITY:** 12 - 192 fibers

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### General Data – Submarine Cable for Integration

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Type</th>
<th>Fiber Count</th>
<th>Fiber Type</th>
<th>Water Depth (m)</th>
<th>Semi-Conductive Sheath</th>
<th>Nom. Diameter (mm)</th>
<th>Weight (kg/m)</th>
<th>Bending Radius (m)</th>
<th>Temperature (°C)</th>
<th>Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>GJMLV</td>
<td>Loose Tube</td>
<td>12-96</td>
<td>4.95x</td>
<td>3000</td>
<td>Available</td>
<td>3.15</td>
<td>0.12</td>
<td>≥ 1.5</td>
<td>-40 to +80</td>
<td>-15 to +40</td>
</tr>
<tr>
<td>GASLMLV</td>
<td>Ribbon</td>
<td>12-192</td>
<td>4.95x</td>
<td>500</td>
<td>Available</td>
<td>3.8</td>
<td>0.4</td>
<td>≥ 1.5</td>
<td>-30 to +60</td>
<td>-15 to +40</td>
</tr>
</tbody>
</table>
Hexatronic’s terrestrial cables and network products offer efficient installation for the entire passive infrastructure. All terrestrial cables are optimized in terms of capacity, quality and operational expenditure, for networks with the highest requirements. In addition, Hexatronic offers a wide variety of fiber optic accessories such as termination panels, rack systems, joint closures etc. All tested and approved for use with submarine cables. For the full range of products from Hexatronic Cables & Interconnect Systems, please refer to the main catalogue Fiber Solutions for Access and Transport Networks or visit www.hexatronic.com

**TERRESTRIAL PRODUCTS**

**Loose Tube Cables**

**TOL 401 2098 GRCLDV, DryTech**

Slim loose tube cable with concentric core design, with up to six tubes per cable. The cable is all dielectric. DryTech filling compound is used in the cable core.

**Design:** Concentric core, extra slim  **Type:** Dielectric, DryTech  
**Capacity:** 12 - 192 fibers  **Diameter:** 11 - 18.5 mm

**Ribbon Cables**

**TOL 401 1013 and TOL 401 1001 GASLDV**

4-fiber ribbon cable using slotted core design. The design reduces installation costs and gives superior fiber protection. The cable is dielectric, making it suitable for installation where there is electrical interference.

**Design:** Slotted core ribbon  **Type:** Dielectric  
**Capacity:** Ø 9.5 mm 4 - 48 fibers, Ø 12.5 mm 4 - 48 fibers, Ø 14 mm 48 - 96 fibers

**TOL 401 1002 and TOL 401 1020 GASLDV**

8-fiber ribbon cable using slotted core design. The design allows high packing density that reduces installation costs and gives superior fiber protection. Water blocking filling compound in the TOL 401 1002 cable and dry water blocking tape in the TOL 410 1020 cable prevents water penetration along the cables. The cable is dielectric, making it suitable for installation where there is electrical interference.

**Design:** Slotted core ribbon  **Type:** Dielectric  
**Capacity:** Ø 15.5 mm 8 - 192 fibers, Ø 20 - 22.5 mm, 288 - 640 fibers

**Product Information – Terrestrial Cables**

<table>
<thead>
<tr>
<th>Product No.*</th>
<th>Product Name</th>
<th>Type</th>
<th>No.</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOL4012098xxA</td>
<td>GRCLDV</td>
<td>Loose Tube</td>
<td>12-96</td>
<td>G.652.D</td>
</tr>
<tr>
<td>TOL4011001xxA</td>
<td>GASLDV</td>
<td>Ribbon</td>
<td>12-96</td>
<td>G.652.D</td>
</tr>
<tr>
<td>TOL4011002xxA</td>
<td>GASLDV</td>
<td>Ribbon</td>
<td>96-192</td>
<td>G.652.D</td>
</tr>
<tr>
<td>TOL4011002xxA</td>
<td>GASLDV</td>
<td>Ribbon</td>
<td>12-192</td>
<td>G.65x</td>
</tr>
</tbody>
</table>
Joint Closure

**NCD 506 + Fiber Joint Closure**

Closure for higher fiber counts in harsh outdoor environments. The generous size of the fiber organizers makes installation fast and trouble free. The design is compact but easy to expand to accommodate very large fiber counts. The closure can also handle mid-span access. Several versions and accessories are available resulting in a total capacity of 144 fibers to more than 2000 fibers depending on configuration.

- **TYPE:** Underground, stainless steel
- **SEALING:** IP class 68
- **CAPACITY:** ≤576 single fiber splices
  ≤288 ribbon fiber splices

**NCD 504 + Fiber/Duct Joint Closure**

Plastic joint closure for outdoor, direct buried installations. The closure is designed for outdoor, underground installation in manholes. The closure can also handle mid-span access.

- **TYPE:** Outdoor, plastic closure
- **CAPACITY:** 96 (single)/192 (ribbon) splices
- **SEALING:** IP class 68

ODF

**NCD 513+ ODF Pre-terminated, with Stub Cable, 2U**

Pre-terminated ODF with a capacity from 24 to 96 SC (192 LC) connectors. Options include: halogen-free, flame-retardant, loose tube, ribbon or micro cable. Optional accessories include horizontal patch cord guides for space-saving mounting directly onto the front of the ODF.

- **TYPE:** Pre-terminated, 19” or ETSI mount, 2U
- **SIZE:** 400x249x86 mm
- **CAPACITY:** 24-96 SC, 24-192 LC
- **CABLE OPTIONS:** Halogen-free, flame-retardant loose tube, ribbon or micro cable, 10-100 m
- **CONNECTOR OPTIONS:** SC, SC/APC, LC, LC/APC
Industry Leading System Solutions for Fiber Optic Communications

Hexatronic Cables & Interconnect Systems develops, manufactures, markets and provides solutions within the fiber optic cable infrastructure, for telecom companies. Hexatronic Cables & Interconnect Systems manufacture fiber optic cable, duct, copper cable and network accessories. The company originates from the former Ericsson site in Hudiksvall. Our products are developed and manufactured by Swedish specialists, with many years of experience and unique expertise in fiber optics. The product portfolio includes the industry leading brands Ribbonet® and Micronet.

A Part of Hexatronic Group

Hexatronic Cables & Interconnect Systems is a part of Hexatronic which is an innovative Swedish technology group, specializing in fiber communications. The Group provides products and solutions for the fiber optic network and together, the independent, entrepreneurial companies offer a full range of passive infrastructure. We combine our large corporate stability and resources with small company flexibility and speed.

Our customers are companies within the telecommunications industry such as communications and telecom suppliers, operators and network owners. The other companies within The Group are, Memoteknik in Skellefteå, Hexatronic Elektronik & Data in Gothenburg, The Blue Shift and Proximion in Stockholm and TD Fiberoptik in Örebro.

For more information about Hexatronic Group: www.hexatronicgroup.com