Submarine Cable Systems
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.

Hexatronic is very solution driven and committed to each project we undertake. We pride ourselves on giving our customers the right solution, on time and on budget. We fully understand and appreciate that every project, no matter how small or large, is important for your business.

The high quality range of flexible solutions are based on scalable and future-proof technology, which ensures a long term, robust and reliable operation, with highly efficient, streamlined data transfer over short and long distances.

**Hexatronic Submarine Cable at a glance:**
- Designed for depths down to 5000 m
- With or without electroding 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](http://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](http://issuu.hexatronicpartners.se)

The pictures shown in this publication are used for illustrative purposes only.
Flexible Solutions for Every Submarine Project

Hexatronic’s Submarine Cable Systems are highly flexible and can be used for shorter distances as well as longer. Whether it be an inland water project, crossing a river or harbor, between small islands or larger underwater applications, we have the knowledge and experience to ensure your project can be completed quickly and cost effectively.

**Extensive knowledge and support**
Drawing on our heritage of technical innovation and a recognized reputation stemming from Ericsson, Hexatronic has a unique knowledge and solid industry experience. Our submarine projects include design, manufacturing and fast delivery anywhere worldwide.

**Time and cost efficient solutions**
Hexatronic offers complete submarine cable solutions and the entire passive fiber infrastructure based on scalable and future proof technology.

- Highly adaptable for each and every project
- Fast response, turn around and delivery times
- No project is too big or too small, we supply any distance from a few up to thousands of kilometers
- Swedish quality and technical proficiency

Hexatronic load out pier. 61°43’08.2”N 17°09’37.7”E.

Hexatronic cable manufacturing plant 34000 m², Hudiksvall, Sweden.
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 incl. ROPA

**The North Sea Project**
- **Cable Type**: Ribbon
- **Project**: Turn-key

**ADONES – The Angola Domestic Network System Project**
- **Cable Type**: Loose tube
- **Project**: Turn-key

**Philippines, Globe Telecom Project**
- **Cable Type**: Loose tube
- **Project**: Turn-key

**NordBalt Project**
- **Cable Type**: Loose tube incl. ROPA
- **Project**: Supply of submarine cables, accessories and 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 single armored (SA) cable is used and for depths greater than 1000 m lightweight protected (LWP) cable is used. An outer wrapping, normally made of high tensile polypropylene yarn is wrapped around the armoring to facilitate the handling of the cable during installation.

The product range comprises of cables and joints for depths down to 5000 m. The loose tube cables are designed for both Universal Joint (UJ) and Universal Quick Joint (UQJ) qualification and are offered with or without electroding capabilities. Electroding allows the cable to be detected and tracked in case it has been broken or moved on the seabed, or to verify burial depth.
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 a 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. The loose tube technique results in a high packing density. This permits a small outer diameter and easy handling.

All loose tube cables and joints are built with the highest quality protection to ensure a long life span for maximum efficiency. This design includes a hermetically sealed stainless tube. Inside the tube the fibers are free to move in the thixotropic water-blocking compound. The tube is protected by a polyethylene sheath, one or two layers of galvanized steel wires flooded in bitumen and then wrapped in a layer of polypropylene yarn.

Lightweight Protected

**GJMLTV 4 ton LWP**
Lightweight protected, loose tube cable for water depths larger than 1000 m.

**DESIGN:** Loose tube, lightweight protected  
**TYPE:** 4 ton, ≤ 5000 m  
**CAPACITY:** 1-48 fibers

Single Armored

**GJMLTV 10 ton SA**
Single armored, loose tube cable where moderate protection is required.

**DESIGN:** Loose tube, single armor  
**TYPE:** 10 ton, ≤ 3000 m  
**CAPACITY:** 1-96 fibers

**GJMLTV 15 ton SAH**
Single armored, loose tube cable where high protection is required. This cable has the same principal design as the GJMLTV 10 ton SA.

**DESIGN:** Loose tube, single armor  
**TYPE:** 15 ton, ≤ 3000 m  
**CAPACITY:** 1-96 fibers
Double Armored

**GJMLTV 15 ton DAL**
Double armored, loose tube cable where high protection is required.

**DESIGN:** Loose tube, double armor  
**TYPE:** 15 ton, ≤ 3000 m  
**CAPACITY:** 1-96 fibers

---

**GJMLTV 25 ton DA**
Double armored, loose tube cable where very high protection is required. This cable has the same principal design as the GJMLTV 15 ton DAL.

**DESIGN:** Loose tube, double armor  
**TYPE:** 25 ton, ≤ 3000 m  
**CAPACITY:** 1-96 fibers

---

**GJMLTV 40 ton DAH**
Double armored, loose tube cable where ultimate protection is required. This cable has the same principal design as the GJMLTV 15 ton DAL.

**DESIGN:** Loose tube, double armor  
**TYPE:** 40 ton, ≤ 3000 m  
**CAPACITY:** 1-96 fibers

---

Electroding – Lightweight Protected

**GJMMLTV 4 ton LWP**
Lightweight protected, loose tube cable for water depths larger than 1000 m. The cable incorporates a copper layer wrapped around the steel tube for electroding.

**DESIGN:** Loose tube, lightweight protected, electroding  
**TYPE:** 4 ton, ≤ 5000 m  
**CAPACITY:** 1-48 fibers

---

Electroding – Single Armored

**GJMMLTV 10 ton SA**
Single armored, loose tube cable where moderate protection is required. The cable incorporates a copper layer wrapped around the stainless steel tube for electroding.

**DESIGN:** Loose tube, single armor, electroding  
**TYPE:** 10 ton, ≤ 3000 m  
**CAPACITY:** 1-96 fibers

---

**GJMMLTV 15 ton SAH**
Single armored, loose tube cable where higher protection is required. This cable has the same principal design as the GJMMLTV 10 ton SA.

**DESIGN:** Loose tube, single armor, electroding  
**TYPE:** 15 ton, ≤ 3000 m  
**CAPACITY:** 1-96 fibers
Electroding – Double Armored

**GJMMLTV 15 ton DAL**
Double armored, loose tube cable where high protection is required. The cable incorporates a copper layer wrapped around the steel tube for electroding.

**DESIGN:** Loose tube, single armor, electroding
**TYPE:** 15 ton, ≤ 3000 m
**CAPACITY:** 1-96 fibers

**GJMMLTV 25 ton DA**
Double armored, loose tube cable where very high protection is required. This cable has the same principal design as GJMMLTV 15 ton DAL.

**DESIGN:** Loose tube, double armor, electroding
**TYPE:** 25 ton, ≤ 3000 m
**CAPACITY:** 1-96 fibers

**GJMMLTV 40 ton DAH**
Double armored, loose tube cable where ultimate protection is required. This cable has the same principal design as GJMMLTV 15 ton DAL.

**DESIGN:** Loose tube, double armor, electroding
**TYPE:** 40 ton, ≤ 3000 m
**CAPACITY:** 1-96 fibers

Submarine Joints for Loose Tube Cables

**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:** Submarine joint for GJMMLTV
**CAPACITY:** 1-96 fibers

**Universal Joint/Universal Quick Joint for Submarine Cables**
UJ/UQJ are technologies 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/UQJ for 10-, 25-, 40 ton submarine cables
**CAPACITY:** 1-96 fibers
## General Data – Loose Tube Cables

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* any commercial available fiber type and color code can be provided

## Standard Product Information – Loose Tube Cables

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<th>Product No.*</th>
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* xx = fiber count (12, 24 & 48) and A is our standard fiber color code

## Standard Product Information – Loose Tube Cable Joints

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* xx = fiber count (12, 24 & 48) and A is our standard fiber color code
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.

**GASLMLTV 20 ton DA**

Double armored, ribbon cable where very high protection is required.

**DESIGN:** Slotted core ribbon, double armor  
**TYPE:** 20 ton, ≤ 500 m  
**CAPACITY:** 4-192 fibers

**GASLMLTV 40 ton DAH**

Double armored, ribbon cable for ultimate protection and with the same principal design as the GASLMLTV 20 ton DA.

**DESIGN:** Slotted core ribbon, double armor  
**TYPE:** 40 ton, ≤ 500 m  
**CAPACITY:** 4-192 fibers

**Single Armored**

**GASLMLTV 5 ton SAL**

Single armored, ribbon cable where light protection is required.

**DESIGN:** Slotted core ribbon, single armor  
**TYPE:** 5 ton, ≤ 500 m  
**CAPACITY:** 4-192 fibers

**GASLMLTV 10 ton SA**

Single armored, ribbon cable for moderate protection. This cable has the same principal design as the GASLMLTV 5 ton SAL.

**DESIGN:** Slotted core ribbon, single armor  
**TYPE:** 10 ton, ≤ 500 m  
**CAPACITY:** 4-192 fibers

**GASLMLTV 15 ton SAH**

Single armored, ribbon cable for high protection. This cable has the same principal design as the GASLMLTV 5 ton SAL.

**DESIGN:** Slotted core ribbon, single armor  
**TYPE:** 15 ton, ≤ 500 m  
**CAPACITY:** 4-192 fibers

**Double Armored**

**GASLMLTV 20 ton DA**

Double armored, ribbon cable where very high protection is required.

**DESIGN:** Slotted core ribbon, double armor  
**TYPE:** 20 ton, ≤ 500 m  
**CAPACITY:** 4-192 fibers
Rock Armored

**GASLMLTV 20 ton RA**

Rock armored, ribbon cable. The third armor layer provides an optimal protection in areas where the cable is exposed to severe mechanical wear and tear.

**DESIGN:** Slotted core ribbon, triple armor, rock armor  
**TYPE:** 20 ton, ≤ 500 m  
**CAPACITY:** 4-192 fibers

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**Submarine Joints for Ribbon Cables**

**Submarine Cable Joint**

Designed for jointing of Hexatronic fiber optic ribbon submarine cables, while maintaining the mechanical, optical and electrical properties of the cable. The joint closure is made of a corrosion resistant stainless steel alloy. The watertight outer housing provides 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.

**DESIGN:** Submarine joint for GASLMLTV  
**CAPACITY:** 4-192 fibers

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**General Data – Ribbon Submarine Cables**

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<th>RA</th>
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<th>Operation</th>
<th>Storage</th>
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* any commercial available fiber type and color code can be provided

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**Standard Product Information – Ribbon Submarine Cables**

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<th>Weight (kg/m)</th>
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<td>10 TON SA</td>
<td>96-192 G.652.D</td>
<td>17/4.2</td>
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<tr>
<td>20 TON DA</td>
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<td>203.0</td>
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<td>22/3.0</td>
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<td>20 TON RAH</td>
<td>96-192 G.652.D</td>
<td>22/3.0</td>
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</table>

* where xx = fiber count (12, 24, 48, 96, 144 & 192) and A is our standard fiber color code
CABLE PARTS FOR INTEGRATION

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.

Global Installations

Hexatronic has delivered more than 3000 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 inter-connect cables for power utilities.
The submarine cable part is based on a hermetically sealed stainless tube. 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 the colored yarns. The cable part is designed to be integrated in submarine electrical power cables.

**GJMLV Submarine Optical Cable Part 1-96 Fibers**

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 longitudinally welded copper tube, followed by a second outer semiconductive polyethylene jacket.

**Design:** Slotted core ribbon  
**Type:** For integration, ≤ 500 m  
**Capacity:** 4-192 fibers

---

**GASLMLV Submarine Optical Cable Part 4-192 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 longitudinally welded copper tube, followed by a second outer semiconductive polyethylene jacket.

**Design:** Slotted core ribbon  
**Type:** For integration, ≤ 500 m  
**Capacity:** 4-192 fibers

---

### 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. ø (mm)</th>
<th>Weight (kg/m)</th>
<th>Bending Radius (m)</th>
<th>Temperature (°C)</th>
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</thead>
<tbody>
<tr>
<td>GJMLV Loose Tube</td>
<td>1-96</td>
<td>G.65x</td>
<td>3000</td>
<td>Available</td>
<td>11.5</td>
<td>0.12</td>
<td>≥ 0.5</td>
<td>≥ 0.5</td>
<td>-40 to +80</td>
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<tr>
<td>GASLMLV Ribbon</td>
<td>4-192**</td>
<td>G.65x</td>
<td>500</td>
<td>Available</td>
<td>18</td>
<td>0.4</td>
<td>≥ 1.5</td>
<td>≥ 0.75</td>
<td>-30 to +60</td>
</tr>
</tbody>
</table>

* any commercial available fiber type and color code can be provided

** max delivery length 16 km for >48 fiber ribbon cables for integration
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.

Loose Tube Cables for Duct Installation

**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, Ø 11-18.5 mm

**GRHLV, Electroding**

Loose tube cable with concentric core design, with four loose tubes with 12 fibers per tube and two insulated copper conductors for electroding. The resistance of the conductors is 12 Ω. Connect the conductors in parallel to get a resistance of 6 Ω.

**DESIGN:** Concentric core, copper conductors  
**CAPACITY:** 12-48 fibers, Ø 13 mm

Ribbon Cables for Duct Installation

**GASLDV**

GASLDV 4 – 8 fiber ribbon cables using slotted core design. The design allows high packing density that reduces installation costs and gives superior fiber protection. A water blocking filling compound and dry water blocking tape 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:** 4-640 fibers, Ø 9.5-22.5 mm

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**Standard Product Information – Terrestrial Cables**

<table>
<thead>
<tr>
<th>Product No.*</th>
<th>Product Name</th>
<th>Type</th>
<th>No.</th>
<th>Fiber</th>
<th>Electroding</th>
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<tbody>
<tr>
<td>TOL41012009xxA</td>
<td>GRCLDV</td>
<td>Loose Tube</td>
<td>12-192</td>
<td>G.652.D</td>
<td>No</td>
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<tr>
<td>TOL41017005xxA</td>
<td>GRHLV incl. Cu 2x1.5 mm²</td>
<td>Loose Tube</td>
<td>12-48</td>
<td>G.652.D</td>
<td>Yes</td>
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<tr>
<td>TOL410110001xxA</td>
<td>GASLDV</td>
<td>Ribbon</td>
<td>12-96</td>
<td>G.652.D</td>
<td>No</td>
</tr>
<tr>
<td>TOL41011002xxxxA</td>
<td>GASLDV</td>
<td>Ribbon</td>
<td>96-192</td>
<td>G.652.D</td>
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* where xx = fiber count (12, 24, 48, 96, 144 & 192) and A is our standard fiber color code

Any commercial available fiber type and color code can be provided.

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 & Interconect Systems, please refer to the main catalogue Fiber Solutions for Access and Transport Networks or visit www.hexatronic.com
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  
**CAPACITY:** ≤576 single fiber splices ≤288 ribbon fiber splices  
**SEALING:** IP class 68

**NCD 504 + Fiber 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

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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 Group is a Swedish company that specializes in product and system solutions primarily within fiber communications. The Group offers a broad range of product and system solutions with a focus on infrastructure for passive fiber optics. Hexatronic has the stability and resources of a large Group, combined with the flexibility and speed of a small company.

Hexatronic operates in a global market and our customers are companies in the telecommunications industry, such as telecom operators, network owners, distributors and systems integrators. The Groups headquarters are in Sweden with sales offices and subsidiaries in Sweden, Norway, Finland, China, Britain, New Zealand and the United States. The Hexatronic share is listed on Nasdaq Stockholm.

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