ONE major project – ONE cable solution
Innovative fiber optic technology
for all performance tests
Fiber Optics
Light switching · Light transportation · Light distribution

Innovative cable technology for the world of tomorrow

The LEONI name stands for first-class cable, system and development expertise. Our innovative solutions are used in the automotive industry and in key sectors of the economy such as telecommunications, IT, healthcare and energy. As an internationally active supplier of wires, optical fibers, cables and cable systems, we have kept up with changes in an increasingly networked world for decades.

This has turned us into an attractive partner and development supplier for many global industrial companies. With our ideas and developments, we contribute to the increased efficiency, safety and environmental performance of their innovations. With more than 70,000 highly qualified employees in more than 31 countries, we are focusing our business on the high-growth core markets Automotive & Commercial Vehicles, Industry & Healthcare, Communication & Infrastructure, Electrical Appliances, Wires & Strands.

Your system partner for the entire value chain

The Business Unit Fiber Optics of the LEONI Group is one of the leading suppliers of high-purity fused silica, preforms and rods, as well as optical waveguides for special applications in industry, optics, sensor technology and analytics, science, communications and in laser medicine.

From fused silica to preforms and the fiber drawn from it to fiber optic cables, challenging assemblies and complete fiber optics systems with self-developed optical components, we offer all the expertise of a global company. As such you benefit from our fiber optic products for an integrated system solution.

Our strengths – your advantage

- Unique value chain
- Client specific product and system solutions
- International development and system partner
- OEM service partner
- Worldwide presence

Raw materials · Fiber production · Cable production · Assembly and medical devices · Optical switches · Optical splitters
Product solutions
For a wide range of applications

Our areas of expertise at a glance

- Communication (cabling systems for industry and buildings)
- Energy (wind, solar, oil, utilities)
- Mechanical & Plant Engineering (drag chain cables, fieldbus cables, optical probes, switches and splitters)
- Automation & Robotics (Industrial Ethernet, bus systems, material-processing high-power lasers)
- Transportation Engineering & Automotive (Rolling Stock, transport, traffic control, MOST, special optical components for automotive applications)
- Industrial Laser Technology (active and passive fiber optic cables for laser welding / laser treatment)
- Medical Devices & Life Science (laser probes, endoscopy components, diagnostics)
- Sensor Technology, Analytics & Spectroscopy (colour, turbidity and gas sensor technology, environmental technology, chemical and food industries, astrophysics)
- Naval & Maritime Engineering (control cable, marine universal & breakout cable, cable for ROV)
- Optics (fused silica, preforms, rods, tubes, wafers, optical blocks)
- Aerospace & Satellite Technology (optical fibers, fiber bundles, probes and control cables; special optical components, e.g. for the Pluto mission)

We are where you need us.
Challenges
For major projects

High complexity of regulations, cable types, installation & handling requirements.

There are total costs of ownership due to a variety of different regulations for major projects’ subsections. Enormous efforts are needed for handling the complexity of large-scaled projects, storage and logistics, installation and maintenance. The great number of suppliers and products, those have to be combined and installed in compliance with local regulations.

- Differing cable standards & requirements in projects’ subsections
- Efforts undertaken for special permissions and approvals
- High planning costs & installation effort
- Environmental factors
- Safety threats due to various safety standards
- No standardisation of the whole project
- Test requirements of cable solutions
- Limitation of fiber or cable diameter
- Need for multiple cable installation
- Comparability of subsections’ quotations
Solution
To simplify major projects handling

**LEONI X-Linked COMpound (LE.X.CO): One design fits all requirements – no multiple installation of cables.**

Advanced and unique X-linked jacket materials for all areas of the project. Designed to comply with requirements for: offshore, railway, industry, marine applications and highly challenging environmental conditions.

- Cables comply with all requirements of any subsection of large-scaled projects
- Various and customized cable designs and protection measures (armour, rodent and water protection, assembly options, fire retardant and fire resistant)
- Reduced planning and installation process preparation
- Suitable for a wide range of challenging environmental factors
  - Jacket type SHF 2 according to IEC60092-360
  - MUD-resistant according to NEK606

**Your benefits**

- Reduced **total costs of ownership** due to simpler cable installation
- Easier handling of project management
- All possible cable designs, including hybrid cables
- No limitation of fiber or cable diameter
- Identical effort for assembly and splicing as for standardized cable types
- Modular system of preforms, fibers, cables, assemblies and optical components to create your own passive optical network
LE.X.CO
Properties of LEONI X-linked COmpond

- Halogen-free (acc. to IEC 60754-1)
- Low degree of gaseous acidity (acc. to IEC 60754-2)
- Flame retardant (acc. to IEC group 60332)
- Non-metallic design on request
- No deformation after installation (heat-pressure tested)
- Highly abrasion resistant
- Excellent UV and ozone resistance

- Best media resistance
- Outstanding longevity under harsh environmental conditions
- Resistant to welding beads
- Functional integrity acc. to IEC 60331-11 /-25 on request
- Customized cable design, imprint & color on request
- MUD resistant according to NEK 606

<table>
<thead>
<tr>
<th>Property</th>
<th>PVC</th>
<th>PUR</th>
<th>FRNC</th>
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<tbody>
<tr>
<td>Absence of halogen</td>
<td>🎁</td>
<td>🎁</td>
<td>🎁</td>
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<tr>
<td>Flame retardancy</td>
<td>🎁</td>
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<tr>
<td>Media resistance</td>
<td>🎁</td>
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<td>Abrasion resistance</td>
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<td>Temperature resistance</td>
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<td>UV resistance</td>
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<td>🎁</td>
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<tr>
<td>Elasticity</td>
<td>🎁</td>
<td>🎁</td>
<td>🎁</td>
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<tr>
<td>Smoke / acidity</td>
<td>🎁</td>
<td>🎁</td>
<td>🎁</td>
</tr>
<tr>
<td>Number of fibers / design not limited</td>
<td>🎁</td>
<td>🎁</td>
<td>🎁</td>
</tr>
</tbody>
</table>

- 🎁 appropriate
- 🎁 partly appropriate
- 🎁 inappropriate

www.leoni-fiber-optics.com
## Design capabilities and certifications
Available for complete range of our cable designs

### Design capabilities
- Central loose tube
- Stranded loose tube
- Breakout
- Minibreakout
- Hybrid
- Zipcord
- Single elements
- Metallic or non-metallic armour
- Customer specific designs

### Certifications
- DNV GL

### Certifications on request
- ABS
- LR
- BV
- UL
- GOST

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![Design capabilities and certifications](www.leoni-fiber-optics.com)

- PE
- PA
- cross-linked FRNC
- LE.X.CO

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LEONI is rising to meet the challenges of the digital era

LEONI profile

In the future, we will be taking past technical product solutions and the knowledge on which these have been based over the last 100 years and combining these with new insights. These include integrated sensor technology, active electronics, embedded software, and the digital functional simulation for a wide range of customer requirements and markets.

This will make LEONI an even more attractive partner for strategic partnerships, digital ecosystems and international development networks.

Enriched with technological intelligence, this new range of products and services is the basis of our reorientation and the foundation for entirely new value propositions for our customers, both now and in the future – always building on our current core expertise.

We call this Connected Intelligence!

LEONI is a global provider of products, solutions and services for energy and data management in the automotive sector and other industries. The value chain encompasses wires, optical fibers, standardised cables, special cables and assembled systems as well as intelligent products and smart services. As an innovation partner and solutions provider, LEONI supports its customers with pronounced development and systems expertise. The market-listed group of companies employs more than 92,000 people in 31 countries and generated consolidated sales of EUR 5.1 billion in 2018.

Further information: www.leoni.com
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