Cables and system solutions for medical technology
Business Unit Healthcare

The Quality Connection

LEONI
The LEONI Group
cable expertise for a very wide variety of industrial markets

LEONI is a leading provider of cables and cable systems as well as services for the automotive sector and many other industries.

Our group of companies employs about 84,000 people in 31 countries. Corporate vision, the highest quality and power of innovation have made LEONI a leading cable sector manufacturer in Europe. LEONI develops and makes a portfolio of technically sophisticated products ranging from wire and optical fibers to cables and through to complete cable systems, and provides the associated services. In addition, the product range comprises strands, standardised cables, hybrid and glass fiber as well as special cables, cable harnesses and wiring system components as well as fully assembled systems for applications in a wide variety of different industrial markets.

Your markets – our strength.
As varied as its range of products and services is, so are the markets and sectors that LEONI supplies. We focus our activities on customers in the sectors Automotive & Commercial Vehicles, Industrial Solutions, Electrical Appliances and Conductors & Copper Solutions.

In the Industrial Solutions market we are among the global market leaders in some product segments. The customers of our Business Unit Healthcare benefit worldwide from our quality products that are as innovative as they are reliable and durable.

LEONI – we make the best connection for your future.
Business Unit Healthcare
the specialist for a demanding market

Are reliable transmission, lasting flexibility, easy handling and maximum patient safety the attributes you want in your medical system or device? Then intelligent wiring is one of the success factors for your product.

LEONI’s Healthcare business unit offers its customers an interrelated range of products and services from engineering to design and production of the cables and through to cable assembly. As a cables specialist and systems supplier, we work in support of development and focus on your particular requirements.

With more than 35 years of experience in the development and production of special cables and a global footprint we are the expert contact for you when it is a matter of the best connection between the functions of your products.
Functionalising connections
LEONI – the cable specialist

Structure, shielding and the materials used are crucial to the hygienic, mechanical and electrical properties of a cable. As a cables specialist, we have a comprehensive range of dedicated technologies and materials that optimise our cables for use in a device or near a patient – ranging from small jumper wires or a single fiber through to complex copper, fiber optic and hybrid solutions.

We custom-produce our cables and can integrate various types of conductors to provide reliable power, signal, data and light transfer as well as media hoses. Our highly miniaturised cables are available with single-core diameters of up to AWG 50.

For near-patient applications we offer biocompatible and lastingly sterilisable cables, the jackets of which can additionally be given a germ-killing effect.

In skin-foam-skin extrusion, the transmission properties of our cables are optimised by means of an extremely stable and consistently structured dielectric. This makes very small diameters possible.
As a systems supplier, we support our customers as early as the development phase of their medical devices as well as design and manufacture the complex cable systems and ready-to-install sub-systems for your products. Our system solutions for imaging processes support the device properties with their electromagnetic compatibility, mechanical resilience and reduced cable volume. The components we incorporate are approved to national or international standards as required. In addition to the wiring, we will fit your product with mechanical and electrical components as well as perform the final function tests in-house.

**Cables and systems for endoscopy and inner body applications**

Our solutions meet not only all the functional demands including geometry and component choice, but also the strictest requirements with respect to cleanliness during the entire manufacturing process. By using LEONI si-tec as jacket material and sealing of tricky spots, our cable systems for endoscopy can thus be steam-sterilised on a sustained basis.
LEONI ORION
the intuitive and high-precision patient positioning system

The LEONI ORION patient positioning system for radiotherapy combines LEONI’s many years of experience in the industrial robotics and medical technology sectors.

LEONI ORION puts all software and hardware components into operation in perfect harmony:
- Intuitively operable software for flexible and easy use.
- A robot and a 3D camera system with real-time control for dynamic positioning in six degrees of freedom and accuracy down to less than 1 mm.
- Cobotics technology for one-to-one translation of the therapist’s manual guidance into the robot’s movement.
- An integrated tool changer for the patient table to significantly reduce the cycle time per patient.

More information on LEONI ORION
Expert and reliable
in diagnostic imaging

The components of our cable systems are approved in accordance with national or international standards. We can thus draw upon more than 700 different UL AWM styles.

By being involved in the process of developing a device at such an early stage, LEONI can specify cable systems with integrated components in the best possible way and minimise interference on the wiring.

Ready-to-install cable systems by LEONI support the long-term mobility of the devices. Fitted with a cable reservoir or spring return system, they can reduce the tensile force on individual cables. In combination with customised hybrid cables, LEONI cable systems form the electrically and mechanically stable transmission channels for your medical devices.

Cables and cable systems by LEONI provide you with:

- **Reliability and image quality** thanks to interference-free transmission
- **Durability** thanks to mechanical resilience
- **Flexibility** thanks to innovative cable routing
- **Mobility** thanks to a reduced cable volume
for highly specialised applications

Diagnostics
Highly flexible cables and cable systems transmit interference-free image data for excellent recording quality.

- X-ray
- Mammography
- Computer tomography (CT)
- Magnetic resonance tomography (MRT)
- Ultrasound/sonography
- Molecular imaging/nuclear medicine
- Endoscopy
- Catheter technology
- ECG, EEG, MEG
- Laboratory technology
- Dental technology

Therapy
Greatest patient comfort and user-friendly handling for minimally invasive interventions.

- Radiotherapy
- Laser medicine
- High-frequency surgery
- Robot and computer-assisted surgery (CAS)
- Laparoscopy
- Catheter technology
- Intracorporeal systems
- Extracorporeal support systems
- Dental technology

Patient monitoring
Long-life, robust cables ensure reliable monitoring.

- ECG
- Oxygen measurement
- Temperature measurement
- Blood pressure measurement

More solutions for laser medicine and endoscopy applications under: www.leoni-fiber-optics.com
Intelligent solutions
for medical equipment
The development work on the cable and system will focus on differing properties depending on the later application. We develop our products in an application-oriented way for our customers and optimise them in terms of hygienic, mechanical and electrical properties:

- lightweight and space-saving with small outer diameters down to AWG 50
- highly flexible, abrasion-proof, long flex life, torsion resistant and drag chain compatible with several million flex cycles
- crush and tension resistant
- low noise, electromagnetically compatible (EMC) and anti-magnetically shielded
- high voltage-resistant
- resistant to oil and chemicals
- wipe disinfectable for the cleaning methods commonly used in hospitals
- autoclavable
- skin compatible and biocompatible pursuant to various classes through to USP Class VI and DIN ISO 10993
- UL and CSA certified

### Antimicrobial cables

Upon request, we supply our products with an antimicrobial outer jacket. This involves acid ions being released by a metal oxide incorporated in the plastic that lower the pH value on the outer surface of the jacket. The result is a germ-killing effect that is not diminished even when there is contact with perspiration or proteins. The formation of a biofilm is simultaneously stemmed.
Expert and reliable in endoscopy and inner body applications

User friendliness thanks to extreme mobility

Reliability thanks to interference-free signal transmission

Image quality thanks to harmonised system components

Patient comfort thanks to miniaturisation, skin compatibility and sliding capacity

Patient safety thanks to excellent image transmission and antimicrobial material use

Hygiene thanks to long-term sterilisability and tight connections

Our silicone cables are:
- REACH (SVHC) compliant
- latex free
- BSE/TSE compliant (no animal products)
- free from phthalates, Bisphenol A
In addition to silicone, we also process a large number of other biocompatible materials.

Having an extensive range of technologies and materials, LEONI can optimise its cables and cable systems for subsequent non-invasive, minimally invasive or invasive use.

LEONI thus makes its customised cables and cable systems not only with minimal dimensions. The cable surfaces also support the patient safety and ease-of-use of medical systems.

With LEONI si-tec, LEONI gives biocompatible silicone cables improved gliding ability, which lasts across numerous autoclave cycles. Antimicrobial LEONI cables have a germ-killing plastic jacket and contribute to reducing the risk of infection in hospitals.

Our production facility of endoscopy and inner body solutions is DIN ISO 13485 certified.
Reliable service right from the start

From consulting and development support for optimum cable layout and material selection to cable routing and build-to-print and through to component assembly as well as customised logistics plan. We offer you all our know-how to optimise your products.

As a systems supplier we support the manufacturers of medical devices and systems as early as the development process, designing the best possible cabling for their products or supplying individual components – from a small jumper wire through to ready-to-install subsystems.

We also offer the individual work steps to manufacture our products as a service to our customers.
Addon services
Fast, flexible and sustainable

Consulting, Engineering & Design
We can draw on many years of experience when planning the best possible and most stress-free cable routing and offer this know-how to our customers as a service. Alternatively, the routing and the design of the cable harnesses is done in the prototype of a device or in a 3D model.

Rapid prototyping of overmoulded components
We use additive manufacturing to rapidly, flexibly and cost-effectively produce injected-moulded prototypes or small-scale production runs. With this service, we offer our customers overmoulded components in the shortest possible time to test the suitability for mass production of certain geometries. This process also allows adjustments to be made quickly and easily.

System verification
We also conduct customer-specific tests in addition to comprehensive electrical, thermal, chemothermal and mechanical standard tests of our products. This involves our cable systems being fitted to device prototypes. We can also design and build our own testing apparatus to be able to simulate the subsequent flex requirements on our connections at the outset and to document their resilience.

The standard tests of our products comprise i.a.:
- High voltage and insulation testing
- Length testing
- Fiber bundle testing
- Crimp height and microsection testing
- Pin assignment testing (2 and 4 pole measurement)
- Function and component testing with cable systems
- Propagation delay measurements
- Tensile strength testing
- Drag chain tests
- Torsion and flex cycle tests
- Tests on tightness of moulded parts
Quality and environment
on that you can rely

LEONI quality management
Consistently high quality is indispensable for our products. At LEONI, the entire process from planning through to completion of a product is subject to constant monitoring. Our quality management system is DIN ISO 9001 – and some cases DIN EN 9100 and DIN ISO 13485 – certified and is continuously monitored.

All cable systems that leave our production lines have previously been 100% tested. Furthermore, we can run mechanical and thermal tests as well as customer-specific testing and measurement methods. For the manufacture and sale of products for the North American market we can also draw on more than 700 different UL styles.

LEONI energy management
Sustainable action will secure the future of our company. In line of economic, environmental and social requirements, we take our social responsibility. We are committed to the continual improvement of energy efficiency and sustainable resource utilisation.

LEONI environmental management
Environmental protection is a mandatory element of our business activity. We ensure, with our DIN EN ISO 14001 certified environmental management system, that our environmental policy is applied effectively.

Well-known OEMs have on multiple occasions already commended our Business Unit Healthcare as supplier of the year.
Expertise worldwide
always near to you

At LEONI, proximity to the customer means not only aspiring to be very close to the wishes and requirements of our partners, to understand and realise them. To us it also means being exactly where our customers are and need us. Not least for this reason, we have in recent years systematically expanded our global network of production and distribution facilities and are now available to our customers in four time zones, covering everything from engineering to the finished product.

The Business Unit Healthcare has production facilities in Germany, Slovakia, Canada, Mexico and China. We also operate with sales offices worldwide.

Our global network enables us not only to respond quickly and effectively, but also makes LEONI an attractive partner worldwide for our global customers. Common systems and processes as well as clear objectives and shared values ensure the highest standards and are maintained without compromise at LEONI.

You will find more detailed contact information of our international partners at: www.leoni-healthcare.com

Germany
LEONI Special Cables GmbH, Friesoythe
LEONI Kabel GmbH, Roth
LEONI elocab GmbH, Georgensgmünd
LEONI Fiber Optics GmbH, Neuhaus-Schierschnitz

France
LEONI CIA Cable Systems S.A.S., Chartres
[Center of competence LEONI ORION]

Slovakia
LEONI Slovakia spol. s.r.o., Stará Turá

Canada
LEONI Elocab Ltd., Kitchener

USA
LEONI Cable Inc., Rochester

Mexico
LEONI Cable S.A. de C.V., Apaseo el Grande

China
LEONI Cable (China) Co., Ltd., Changzhou
LEONI Cable (China) Co., Ltd., Shanghai

India
LEONI Cable Solutions (India) Pvt. Ltd., Pune
Our best recommendation: satisfied customers

Convincing product properties and quality, which ensure an "enduring solution", partnership-like collaboration and customer-oriented service are the basis of our partners' satisfaction. We urge you, too, to discover the merits of a portfolio that offers you the best solution for any application.

Do familiarise yourself with a value chain that will support you perfectly at all levels from the consultation through to a dedicated logistics concept.