

# Fiber optic solution

## Data networks in rolling stock engineering



### Areas of application

Our fiber optic cables are an important component in the data networks and passenger information systems used in rolling stock, trolleybuses and rail-related applications, in both infrastructure and high-voltage applications.

They are suitable for connecting fixed-installation components for low-loss and EM-compatible data and signal transmission.

With modular solutions from LEONI customised to your exact requirements, you are perfectly equipped to handle the long-term trend towards device and application networking in any area.

### Your advantages

- Excellent data transmission > 10 GB/s
- Cross-linked sheath material LE.X.CO
- High resistance to typical rail service fluids
- Excellent fire prevention profile (tested vs. EN 45545-2)
- Low fire load, halogen-free
- Bend-optimised fibers
- Reduced weight
- Maximum flexibility for easier installation
- Available as a cable or preassembled product

### Structure

- Fiber: OM3 multi-mode (other fibers on request)
- Cable: 4 cores with one fiber each (other configurations on request)
- Connector: 4 x SC/PC (other connectors on request)
- Cable sheath: LE.X.CO (LEONI X-linked COMpound)
- Sheath colour: blue



# LEONI

**Fire prevention in rolling stock\***

- EN 45545-2, hazard level HL1 – HL3
- Vertical flame spread  
**Single cable: EN 60332-1-2**  
**Bunched cable: EN 50305**
- Smoke density  
**EN 61034-2**  
(>70 % transmission), HL1 – HL3
- Combustion gas toxicity  
**EN 50305 9.2**  
(ITC < 6), HL1 – HL3
- Halogen content  
**EN 50267-2-1, EN 60684-2**
- Combustion gas corrosivity  
**EN 50267-2-2**

Requirements clause (relevant component no.)	Test procedure reference	Parameter and unit	Maximum or minimum	HL1	HL2	HL3
R15 (EL1A)	T09.01 EN 60332-1-2	Uncharred length mm	Minimum	Charred part ≤ 540 Uncharred part > 50	Charred part ≤ 540 Uncharred part > 50	Charred part ≤ 540 Uncharred part > 50
	T09.02 EN 60332-3-24 (for d ≥ 12 mm)	m	Maximum	2,5	2,5	2,5
	T09.03 EN 50305 (for 6 mm < d < 12 mm)	m	Maximum	2,5	2,5	2,5
	T09.04 EN 50305 (for d ≤ 6 mm)	m	Maximum	1,5	1,5	1,5
	T13 EN 61034-2	Transmission %	Minimum	25	50	70
	T15 EN 50305	ITC Dimensionless	Maximum	10	10	6

\* Other fire prevention standards on request

**Transmission properties/technical data**

- Maximum attenuation  
**850 nm 3.0 dB/km**  
**1300 nm 1.0 dB/km**
- Bandwidth (overfilled launch)  
**850 nm 1500 MHz x km**  
**1300 nm 500 MHz x km**
- Effective modal bandwidth-length product  
**850 nm 2000 MHz x km**
- Numerical aperture  
**0.200 +/- 0.015**
- Connector: Attenuation  
**< 0,2 dB**
- Data transmission  
**10 Gigabit/s with 10GBASE-SR**  
**40 Gigabit/s with 40GBase-SR4**  
**100 Gigabit/s with 100GBase-SR10**

**Cable sheath properties**

- Excellent mechanical material properties (tested vs. EN 50264-1)
- Highly flexible material for simple installation
- Cold flexibility to -25 °C
- Resistant to mineral oils and fuels (tested vs. EN 50264-1 EM 101)
- Resistant to ozone (tested vs. EN 50264-1 EM 101)
- Resistant to acids and bases (tested vs. EN 50264-1 EM 101)
- High resistance to typical rolling stock detergents and lubricants
- Low water absorption, for deployment in areas where high levels of moisture and water from condensation are to be expected
- UV-resistant

**Properties of pre-assembled products**

- Suitable for typical rail plug connectors
- Waterproof to IP 68 in split hood housing
- Optimised anti-kink protection
- Customised to your needs
- Quality-tested