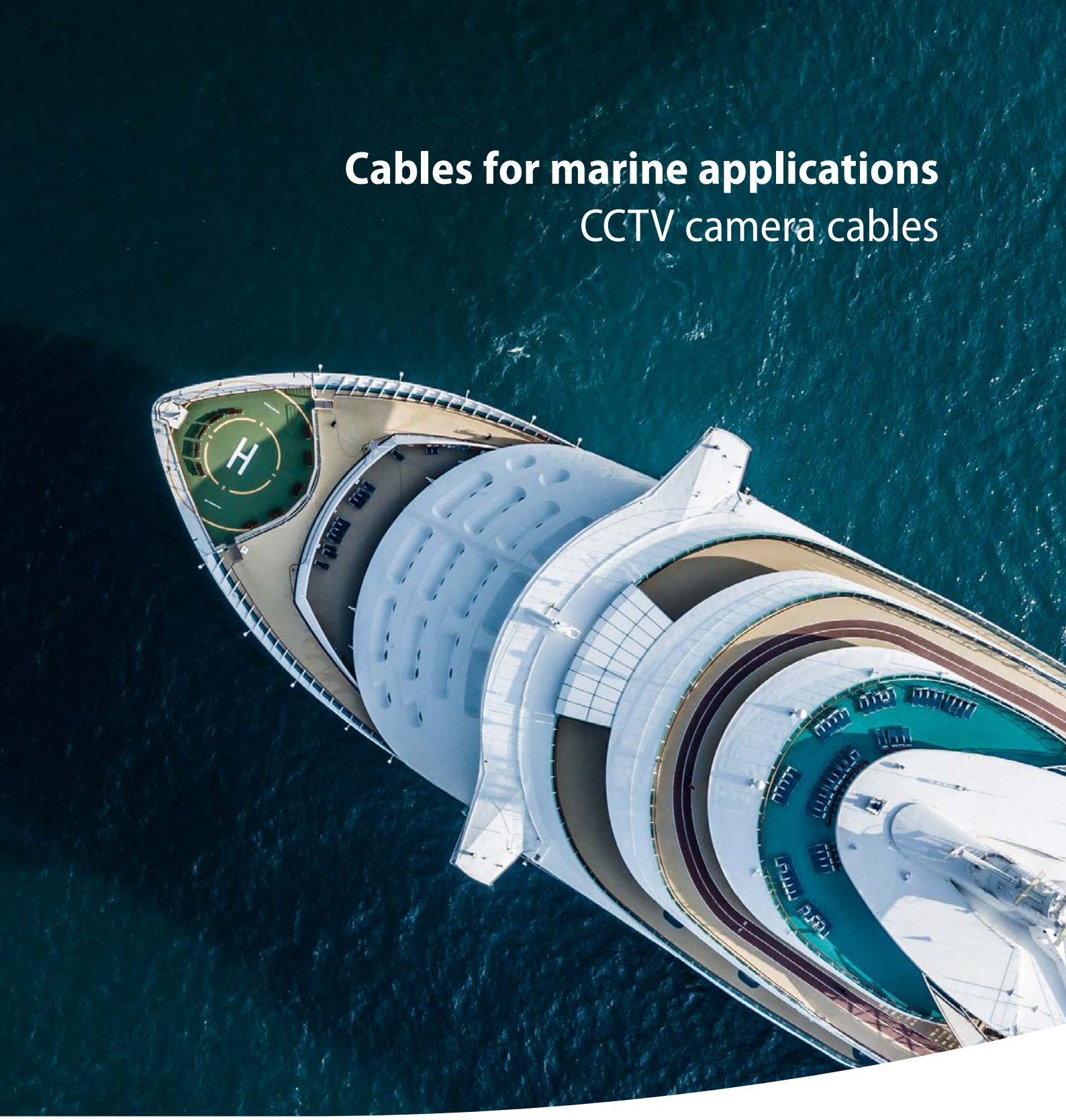
Cables for marine applications

CCTV camera cables



The Quality Connection

FELTEN
WIRE & CABLE SOLUTIONS

LEONI solutions for Marine applications

With the market Marine, LEONI provides the customers with all the expertise of a global enterprise, focused on the needs of the shipbuilding industry. With an extensive portfolio of products and services, LEONI will assist you across the entire lifecycle of your projects – worldwide.

As a strong partner, LEONI offers application-specific cables and cable system solutions meeting national and international standards. You can trust in the well-founded sector and product knowledge as well as many years of experience.

Innovative quality products, proven and project-related system solutions, as well as highest availability and sustainable service management are matter of course for LEONI.

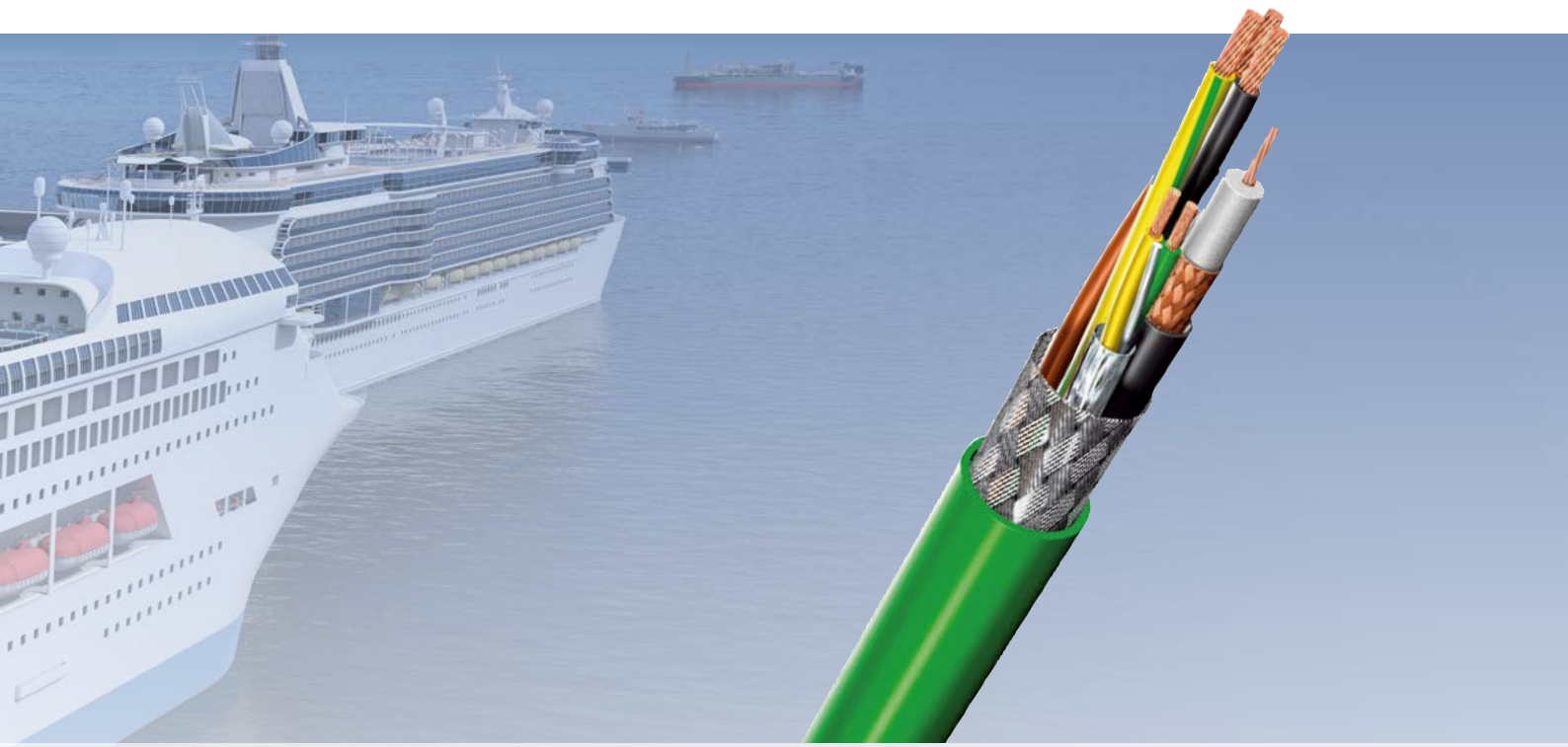
The LEONI group

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 informations www.leoni.com

CCTV camera cables

for video applications



With the knowledge of customer's special requirements in CCTV camera cable applications, LEONI is able to offer cables with halogen content sheathing materials or alternatively with halogen-free cross-linked material. The cables can be designed for fixed installation or for flexible application.

Technical competence

LEONI is able to include in the CCTV camera cables

- Power cores
- Signal cores
- Coaxial elements
- Data pairs Cat 5e, Cat 6, Cat 6A and Cat 7
- Bus elements like PROFIBUS or CAN-Bus
- Fiber optic cabling elements
- Special designed electrical screens

Wire design can be

- Solid
- Stranded
- Bare copper
- Tin plated
- Nickel plated
- Silver plated

For sheathing materials, LEONI can offer cables for different temperature ranges and technical requirements

- Halogen-free FRNC material for a temperature range from –40 °C up to +80 °C
- Marine approved halogen-free SHF1 material for a temperature range from –40 °C up to +90 °C
- Marine approved halogen-free SHF2 material for a temperature range from –50 °C up to 105 °C
- Marine approved halogen-free SHF2 mud resistant material (NEK 606) for a temperature range from –50 °C up to +105 °C
- Halogen-free silicone material for a temperature range from –55 °C up to +180 °C (20.000 h according to Arrhenius behaviour)
- ETFE material for a temperature range from –65 °C up to +130 °C (20.000 h according to Arrhenius behaviour)
- FEP material for a temperature range from –65 °C up to +200 °C (20.000 h according to Arrhenius behaviour)
- PTFE material for a temperature range from –65 °C up to +260 °C (20.000 h according to Arrhenius behaviour)
- Polyurethane material for a temperature range from –50 °C up to +90 °C
- Rodent and termite protection

The final temperature range of the cables depends on the materials used for insulation, taping and sheathing. If required, other special approvals are also possible.

	CCTV camera cable		CCTV camera cable	
Application	Video monitoring		Video monitoring	
Technical data				
	Coaxial element		**Coaxial element**	
Conductor resistance	≤ 36 Ω/km		≤ 42 Ω/km	
Insulation resistance	≥ 10 GΩ*km		≥ 10 GΩ*km	
Capacity [1 kHz]	~ 54 nF/km		~ 54 nF/km	
Characteristic impedance	75 ± 4 Ω		75 ± 4 Ω	
Test voltage (core/shield)	2000 V at rms 50Hz 1min		2000 V at rms 50Hz 1min	
	Data pairs 0,56 mm²	**Power supply wires 1,5 mm²**	**Data pairs 0,56 mm²**	**Power supply wires 1,5 mm²**
Conductor resistance	≤ 33 Ω/km	≤ 13 Ω/km	≤ 33 Ω/km	≤ 13 Ω/km
Insulation resistance	≥ 20 MΩ*km	≥ 20 MΩ*km	≥ 20 MΩ*km	≥ 20 MΩ*km
Nominal Voltage (effective value)	≤ 100 V	≤ 100 V	≤ 100 V	≤ 100 V
Test voltage (core/core)	1000 V at rms 50 Hz 1min	1000 V at rms 50 Hz 1min	1000 V at rms 50Hz 1min	1000 V at rms 50 Hz 1min
Test voltage (core/shield)	500 V at rms 50 Hz 1min	500 V at rms 50 Hz 1min	500 V at rms 50Hz 1min	500 V at rms 50 Hz 1min
Core-Ø nom.	1.5 mm² : 2.2 mm 0.56 mm² : 1.6 mm		1.5 mm² : 2.2 mm 0.56 mm² : 1.6 mm	
Outer jacket	SHF1		SHF1	
Cable-Ø min. / max.	11.6/12.2 mm		11.6/12.2 mm	
Weight nom.	206 kg/km		206 kg/km	
Mechanical properties				
Temperature range	during operation –25 °C to +70 °C during installation –10 °C to +50 °C		during operation –25 °C to +70 °C during installation –10 °C to +50 °C	
Bending radius	during operation 8 × Ø during installation 4 × Ø		during operation 7.5 × Ø during installation 3.75 × Ø	
Burning characteristics	IEC 60332-1-2, IEC 60332-3-22, IEC 61034-2, IEC 60754-1 & -2, Def-St. 02-713, IEC 60695-7-1		IIEC 60332-1-2, IEC 60332-3-22, IEC 61034-2, IEC 60754-1 & -2, Def-St. 02-713, IEC 60695-7-1	
Type designation	02YSCH 0.8/3.5-75 L-H 3X1.5 L-H CH 2X2X0.56 PIMF GN FRNC		02YSCH 0.86/3.5-75 LI L-H 3X1.5 L-H CH 2X2X0.56 PIMF GN FRNC	

	 Digital CCTV cable	 CCTV camera cable with functional integrity during fire
Application	Video monitoring	Video monitoring in case of fire
Technical data		
	LI9Y(ST)C 4X2X0.6/1.2-100 (Cat5)	**02YS(FE)C(FE) 4X2X0.60/1.67-100 PIMF (Cat5)**
Loop resistance	≤ 180 Ω/km	≤ 180 Ω/km
Insulation resistance	≥ 5 GΩ*km	≥ 5 GΩ*km
Transit time	≤ 5.3 ns/m	
Capacity [1 kHz]	~ 50 nF/km	~ 50 nF/km
Operating voltage	100 V	30 V
Test voltage (core/core/shield)	1000 V at rms 50 Hz 1 min	1000 V at rms 50 Hz 1 min
	Wire LIH 1.5/2.2 (Power)	**Wire LI(FE)H 1.5/3.2**
Conductor resistance [1,5 mm²]	≤ 14 Ω/km	≤ 14 Ω/km
Insulation resistance	≥ 20 MΩ*km	≥ 20 MΩ*km
Operating voltage	100 V	100 V
Test voltage (core/core/shield)	1000 V at rms 50Hz 1min	1000 V at rms 50Hz 1min
Core-Ø nom.	1.5 mm² : 2.2 mm 0.22 mm² : 1.2 mm	1.5 mm² : 3.2 mm 0.22 mm² : 1.7 mm
Outer jacket	SHF1	SHF1
Cable- Ø min. / max.	9.9/10.5 mm	14.8/15.8 mm
Weight nom.	150 kg/km	282 kg/km
Mechanical properties		
Temperature range	during operation –25 °C to +90 °C during installation –10 °C to +50 °C	during operation –40 °C to +80 °C during installation –10 °C to +50 °C
Bending radius	during operation 7 × Ø during installation 5 × Ø	during operation 8 × Ø during installation 4 × Ø
Burning characteristics	IEC 60332-1-2, IEC 60332-3-22, IEC 61034-2, IEC 60754-1 & -2, Def-St. 02-713, IEC 60695-7-1	IEC 60332-3-22, EN 50200 (≥ PH120), EN 50289-4-16, IEC 61156-5 (Cat5) (must be testified)
Type designation	LI9Y(ST)C 4X2X0.6/1.2-100 LIH H 3X1X1.5 GN FRNC	02YS(FE)C(FE) 4X2X0.60/1.67-100 PIMF LI(FE)H H 3X1X1.5 GN

	CCTV camera cables for explosive atmospheres	PROFINET
Application	Video monitoring in explosive atmospheres	Video monitoring with PoE characteristics
Technical data		
	02YSFC 4X2X0.60/1.43-100 PIMF (Cat6)	
Loop resistance	≤ 140 Ω/km	≤ 180 Ω/km
Insulation resistance	≥ 20 MΩ*km	≥ 500 MΩ•km
Transit time	≤ 5.3 ns/m	
Capacity [1 kHz]	~ 50 nF/km	
Characteristic impedance 100 MHz	(100 ± 5) Ω	
Surface transfer impedance 10 MHz	≤ 100 m Ω/m	
Operating voltage	100 V	80 V
Test voltage (core/core/shield)	1000 V at rms 50 Hz 1 min	700 V at rms 50 Hz 1 min
	Wire LIH 1.5/2.2 (Power)	
Conductor resistance [1,5 mm^2]	≤ 14 Ω/km	
Insulation resistance	≥ 20 MΩ•km	
Operating voltage	240 V	
Test voltage (core/core/shield)	1000 V at rms 50Hz 1min	
Signal run time		≤ 5.13 ns/m
Core-Ø nom.	1.5 mm^2 : 2.2 mm 0.22 mm^2 : 1.43 mm	AWG 24: 1.05 mm
Outer jacket	SHF1	SHF2, mud resistant acc. to NEK606
Cable- Ø min. / max.	12.1/12,7 mm	8.4/9.0 mm
Weight nom.	210 kg/km	91 kg/km
Mechanical properties		
Temperature range	during operation –30 °C to +80 °C during installation –30 °C to +80 °C	during operation –40 °C to +80 °C during installation –25 °C to +80 °C
Bending radius	during operation 8 × Ø during installation 4 × Ø	during operation 8 × Ø during installation 4 × Ø
Burning characteristics	IEC 60332-1-2	IEC 60332-1-2
Type designation	02YSFC 4X2X0.60/1.43-100 PIMF LIH H11Y 3X1X1.5 GN	2YH(ST)C11Y 4X2X0.6/1.05-100 LI GN

Customised CCTV camera cable

Customised CCTV camera cable with fiber optic elements

Application	Video monitoring in harsh environments	Video monitoring in harsh environments
Technical data		
	Coaxial element	**Optical fiber**
Conductor resistance	≤ 86 Ω/km	I-V(ZN)H 1G62.5/125 STB900H BU Ø 2.8 mm
Insulation resistance	≥ 5 GΩ*km	**Optical fiber**
Characteristic impedance (5	(75 ±3) Ω	I-V(ZN)H 1E9/125 STB900H OG Ø 2.8 mm
MHz)	~ 55 nF/km	
Capacity [1 kHz]	≤ 3.3 dB/100m	
Attenuation (5 MHz)	100 V	
Operating voltage	1500 V at rms 50 Hz 1 min	
Test voltage (core/shield)	**Wire LIH 2.5/3.3 VZN**	**Wire LIH 1.5/2.8 VZN**
	≤ 8.5 Ω/km	≥ 13 Ω/km
Conductor resistance	≥ 10 MΩ*km	≥ 20 MΩ*km
Insulation resistance	300 V	300 V
Operating voltage	1500 V at rms 50Hz 1min	2000 V at rms 50 Hz 1 min
Test voltage	**Screened pair**	
	≤ 90 Ω/km	
Conductor resistance	≥ 5 GΩ*km	
Insulation resistance	100 V	
Operating voltage	1500 V at rms 50Hz 1min	
Test voltage		
Core-Ø nom.	2.5 mm^2 : 3.3 mm	1.5 mm^2 : 2.8 mm
	0.22 mm^2 : 1.2 mm	
Outer jacket	SHF2, mud resistant acc. to NEK606	SHF2, mud resistant acc. to NEK606
Cable- Ø min. / max.	19.8/20.8 mm	12.0/13.0 mm
Weight nom.	611 kg/km	195 kg/km
Mechanical properties		
Temperature range	during operation –25 °C to +80 °C	during operation –25 °C to +80 °C
	during operation 20 × Ø	during operation 20 × Ø
Bending radius	during installation 10 × Ø	during installation 10 × Ø
Burning characteristics	IEC 60332-1-2, IEC 60332-3-24	IEC 60332-1-2, IEC 60332-3-24 (Cat.C) (must be testified)
Type designation	02YSCH 2X0.6/2.4-75 LI LI2Y 2X2X0.22 PIMF LIH (ZN)CH(Z)HX 4X1X2.5 VZN OR	I-V(ZN)H 2X1G62.5/125 STB900H I-V(ZN)H 2X1E9/125 STB900H LIH (ZN)CHX 3X1X1.5 VZN OG