

Innovative RADOX[®] railway cables

Edition 2008



Bridging our know how





Interdisciplinary knowledge

The HUBER+SUHNER Group is a leading international manufacturer of electrical and optical interconnectivity components and systems. Our main markets are communication, transport and industry. Under one roof, we combine technological capabilities in the three core fields of Radio Frequency, Fiber Optics and Low Frequency.

As one of Europe's leading suppliers, HUBER+SUHNER offers a wide range of products which provide the platform to build modern rail vehicles.

New and innovative products based on our proven technologies supports you to fulfil the demanding requirements of the railway industry.



Core capabilities united under one single roof

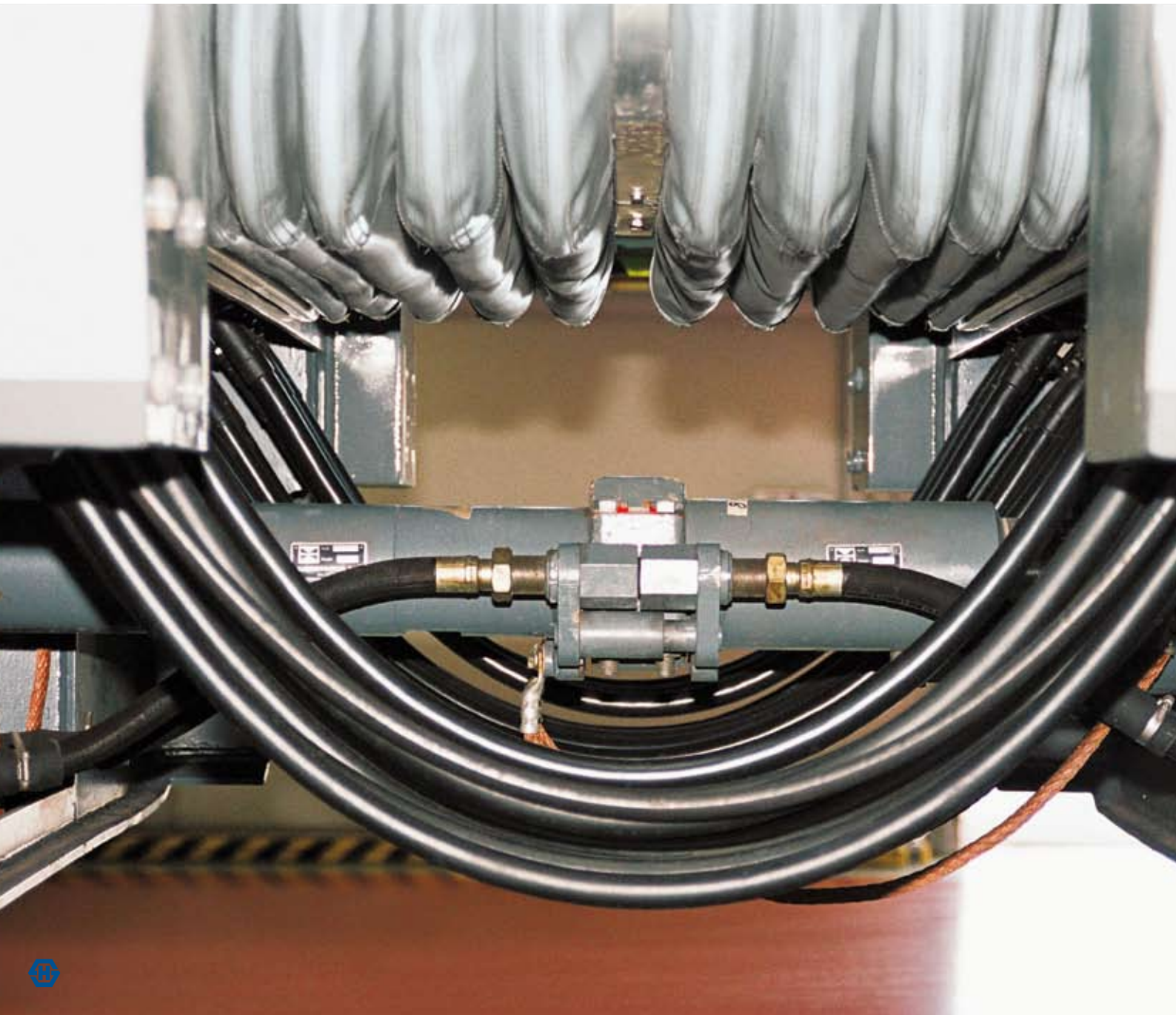
Our many years of experience in the railway market offer our customers the certainty that they will receive innovative products with perfect performance. Our worldwide sales organisation guarantees local presence and support.

Our capabilities

- Global customer support
- Customised cable design
- Material development
- Cable production
- Cable testing
- Quality and safety (ISO 9001, IRIS «pending»)

RADOX® JUMPER cables

RADOX® JUMPER cables are specially designed for demanding applications, where movements combined with enhanced fire performance is required.



Features:

- Proven RADOX® cables
- Customized solutions
- Mechanically robust

Benefits:

- Long service life



«Meets fire performance requirements according to DIN 5510-2»

RADOX® JUMPER cables product range

Single core

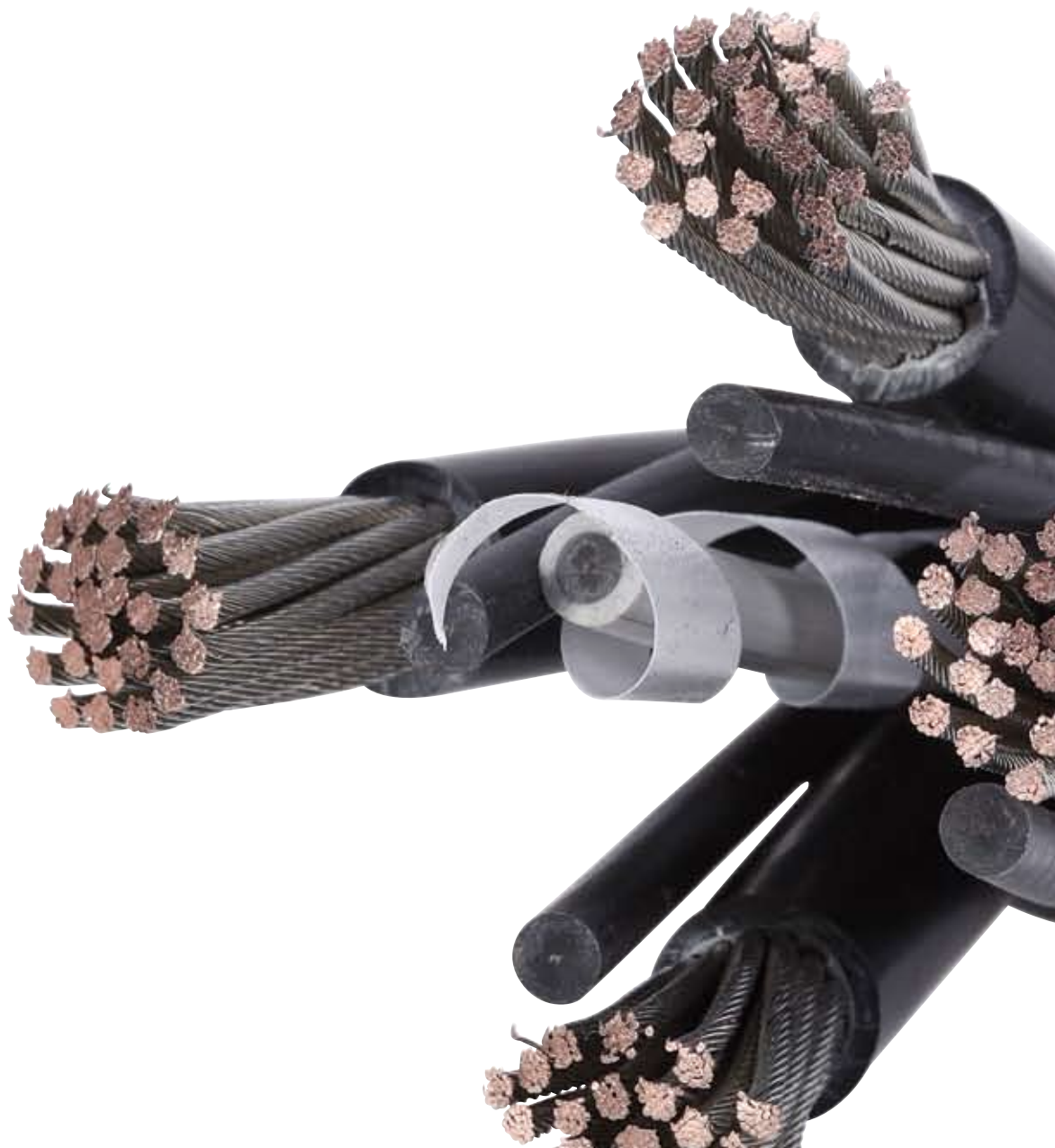
Voltage	Cross section	EMC screen	Torsion resistant
1800 V	16 - 240 mm ²	no	no
1800 V	16 - 240 mm ²	yes	yes

Conductor: • Tin plated copper braid, special construction

Insulation: • 2-layers
• Outer layer EM 104 J

Screen: • Tin plated copper braid

Torsion resistant: • Textile yarn braid



Multi core cables

Based on our proven RADOX® railway cables, we customise cable designs to specific customer needs.

HUBER+SUHNER's wide product range also enables us to combine the following transmission technologies in a single cable (hybrid solutions).

- Signal transmission
- Power transmission
- Radio frequency transmission
- Fiberoptic transmission



RADOX® JUMPER cables

In order to ensure a long service life in demanding environments, we test our cables extensively.

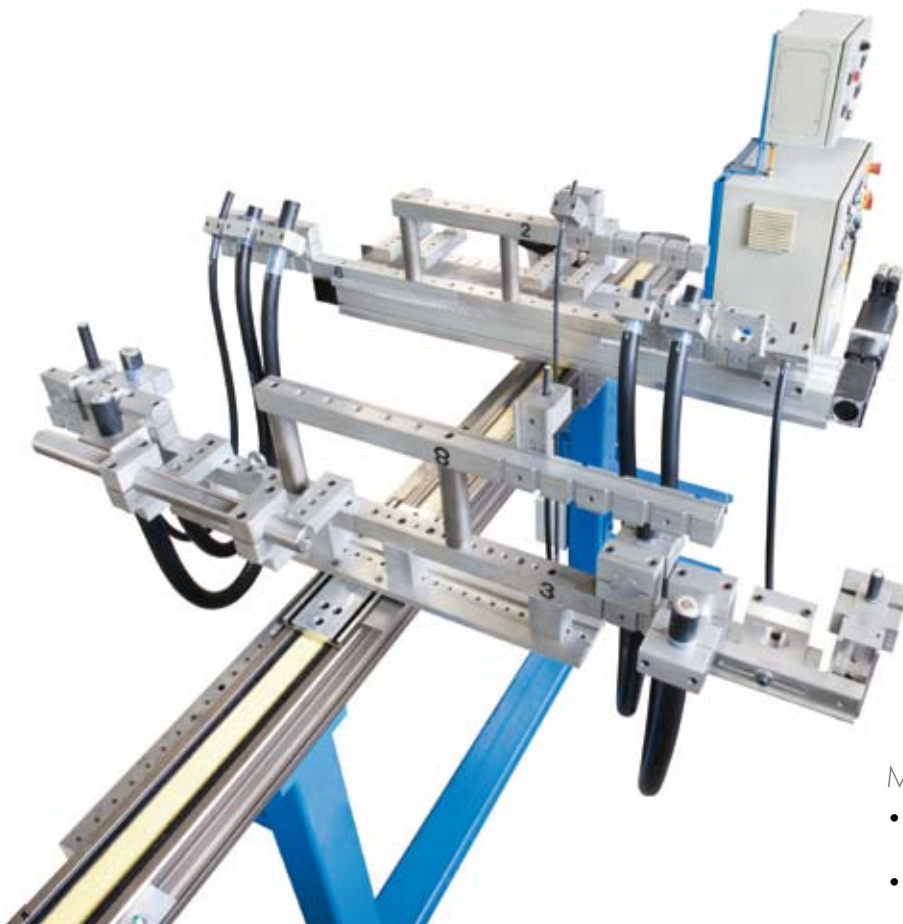
Fire tests

- DIN 5510-2 (2007)
- NF F 16-101



Environmental testing, e.g.

- Ozone resistance
- Mineral oil resistance
- Acid resistance
- Alkali resistance
- Thermal aging
- Low-temperature bending and impact resistance



Mechanical testing of jumper cables, e.g.

- Bending test >3 million cycles according to ICE III test procedure
- Hammer impact test according to EN 60068-2-75 (1997)
- Falling rocks - ballast attack
- Jacket abrasion

RADOX® RAILCAT5 databus cable

Innovations for the railway market

One of the HUBER+SUHNER innovations specifically developed for the railway market is the CAT5 RADOX® RAILCAT5 data bus cable for high-speed data transmission such as in ethernet links, multimedia applications, video transmission, distribution of WiFi-networks, passenger information systems etc..

Description

Meets the demanding requirements of the railway market as well as the fire safety requirements according to the most important European fire performance standards for rolling stock DIN 5510-2, BS 6853 and NF F 16-101 and the requirements for databus cables according to EN 50288-2-2.

«DIN 5510-2»

«NF F 16-101»

«BS 6853»



Characteristics

- Developed and tested specifically for railway applications
- Proven RADOX® insulation system
- Excellent mechanical characteristics
- Operating temperature range -40°C to +90°C
- Halogen-free, low smoke, low toxicity

Customer value

- High data transmission rate
- Standardised CAT5 data bus cable
- Compatible with M12 and RJ 45 connector systems





RADOX® EN 50264 and EN 50306 cables

HUBER+SUHNER offers two new traction cable families for today's demanding railway market. Thanks to the newly developed RADOX insulation system and RADOX sheath material the new cable families fulfil the requirements of the EN 50264 and EN 50306 standards.

Characteristics

- Meets completely the demanding mechanical, electrical and fire safety requirements of

EN 50264 and EN 50306

Customer value

- Standardised Europe-wide cable range with defined properties.





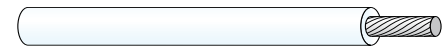
RADOX® EN 50306 railway cables with thin wall

Single core

according to EN 50306-2

Voltage	Cross section	Notes
300 / 500 V	0.5 - 2.5 mm ²	white, -40... +105°C

Family identification: RADOX EN 50306-2



Multi core cable

according to EN 50306-4 P, for protected installation

Table	Voltage	Cross section	No. of cores	Screened
1	300 / 500 V	0.5-2.5 mm ²	2-48	no
3	300 / 500 V	0.5-2.5 mm ²	2-8	yes
5	300 / 500 V	0.5-1.5 mm ²	2-7 pairs	no

Family identification: RADOX EN 50306-4



Multi core cable

according to EN 50306-4 E, for exposed installation

Table	Voltage	Cross section	No. of cores	screened
1	300 / 500 V	0.5-2.5 mm ²	2-48	no
3	300 / 500 V	0.5-2.5 mm ²	2-8	yes
5	300 / 500 V	0.5-1.5 mm ²	2-7 Paare	no

Family identification: RADOX EN 50306-4:





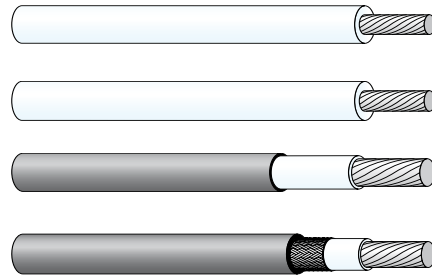
RADOX® EN 50264 railway cables with reduced wall thickness

Single core

according to EN 50264-3-1

Voltage	Cross section
600 / 1000 V	1-400 mm ²
1800 / 3000 V	1.5-400 mm ²
1800 / 3000 V	1.5-400 mm ²
3600 / 6000 V	1.5-400 mm ²

Family identification: RADOX EN 50264-3-1

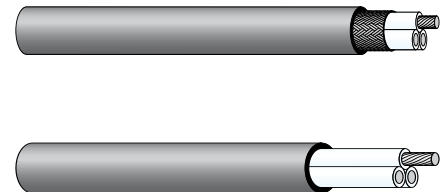


Multicore cable

according to EN 50264-3-2

Table	Voltage	Cross section	No. of cores	Screened
1	300 V	1-2.5 mm ²	2-40	no
2	300 V	1-2.5 mm ²	2-40	yes
4	600 V	1.5-50 mm ²	2	no
5	600 V	1.5-50 mm ²	2	yes
6	600 V	1.5-50 mm ²	3	no
7	600 V	1.5-50 mm ²	3	yes
8	600 V	1.5-50 + 25 mm ²	4	no
9	600 V	1.5-50 + 25 mm ²	4	yes

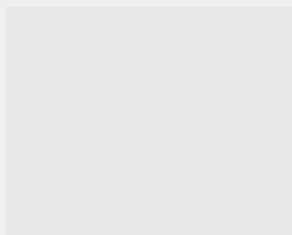
Family identification: RADOX EN 50264-3-2



HUBER+SUHNER is certified according to ISO 9001 and ISO 14001.

WAIVER

It is exclusively in written agreements that we provide our customers with warrants and representations as to the technical specifications and/or the fitness for any particular purpose. The facts and figures contained herein are carefully compiled to the best of our knowledge, but they are intended for general informational purposes only.



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