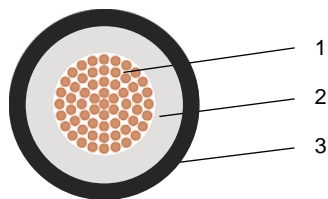


## Technical datasheet

### BETrans® 4 GKW-ENX R 1800 V M



#### Product description

Halogen free, double-insulated, electron-beam cross-linked lead wire with optimised dimensions and improved fire performance. The cables fulfil requirements for compound EI 109 (class M) listed in EN 50264-3-1 and are highly resistant to UV, oil and diesel, as well to elevated temperature. Excellent thermal properties of insulation material result in expectation of higher life time as well in elevation of current rating capacity.

#### Application

These cables are used for protected installations inside and outside of rail vehicles and buses and other rail vehicles for the connection of fixed and moved parts. These cables have optimised outer diameter and therefore they are applied in applications where space is very limited. Cables are suitable for the wiring of electric engines, switch and auxiliary boards, converters and distribution boxes. Due to the double-insulated design, these cables are qualified for short circuit and earth fault-proof applications. For installation the guidelines of EN 50355 and EN 50343 must be considered.

#### Construction

1. conductor	tinned fine copper strands according to VDE 0295 / IEC 60228 class 5
2. insulation colour	polyolefine copolymer electron-beam cross-linked, Comp 752, EI 109 according to EN 50264-3-1 white
3. outer sheath colour marking	polyolefine copolymer electron-beam cross-linked, Comp 752, EI 109 according to EN 50264-3-1 black, other colours: blue, orange, red are available upon request

**LEONI BETATRANS 4 GKW-ENX R (EN 50264-3-1) 1800 V ..... M CCHDA ..... - ..... .....**

1. cross section	e. g. 4
2. part no.	e. g. 312475
3. production order no.	e. g. 1181052
4. production date	e. g. 290419

#### Product properties

nominal voltage	$U_0/U$	1.8/3 kV AC
max. voltage	$U_{0m}$	2.16 kV AC
max. voltage	$U_m$	3.6 kV AC
max. voltage	$V_0$	2.7 kV DC
max. voltage	$V_m$	5.4 kV DC
testing voltage		6.5 kV AC (50 Hz / 5 min.)
max. conductor temperature	fixed installation	+120 °C (20.000 h / at 50 % elongation)
	sporadically moved	+90 °C
	short circuit	+280 °C / 5 sec.
min. ambient temperature	fixed installation	
min. bending radius	> 3 x Ø	-40 °C
	> 5 x Ø	-50 °C
min. ambient temperature	sporadically moved	
all cables	> 8 x Ø	-40 °C

#### Technical data

weights, dimensions and conductor resistances	doc. no.: 11089
current ratings	doc. no.: 12089

## Technical datasheet

### BETrans® 4 GKW-ENX R 1800 V M

#### Fire performance for rolling stock

vertical flame propagation for a single insulated wire or cable  
 vertical flame spread of bunched wires or cables > 6 < 12 mm  
 vertical flame spread of bunched wires or cables < 6 mm  
 smoke density  
 toxicity of smoke  
 absence of halogens  
  
 corrosivity of gases

#### EN 45545-2

EN 60332-1-2  
 EN 60332-3-25  
 EN 50305  
 EN 61034-2  
 EN 50305  
 EN 50267-2-1  
 EN 60684-2  
 EN 50267-2-2  
 EN 50267-2-2

#### hazard level HL1 - HL3

carbonisation > 50 and ≤ 540 mm  
 carbonisation < 2.5 m  
 carbonisation < 1.5 m  
 transmittance > 70 %  
 ITC ≤ 3  
 HCl and HBr < 0.5 %  
 HF < 0.1 %  
 pH > 4.3  
 conductivity < 10 µS / mm

#### Fire performance for rolling stock

vertical flame propagation for a single insulated wire or cable  
 vertical flame spread of bunched wires or cables > 6 < 12 mm  
 vertical flame spread of bunched wires or cables < 6 mm  
 smoke density  
 toxicity of smoke  
 absence of halogens  
  
 corrosivity of gases

#### EN 50264-1

EN 60332-1-2  
 EN 60332-3-25  
 EN 50305  
 EN 61034-2  
 EN 50305  
 EN 50267-2-1  
 EN 60684-2  
 EN 50267-2-2  
 EN 50267-2-2

carbonisation > 50 and ≤ 540 mm  
 carbonisation < 2.5 m  
 carbonisation < 1.5 m  
 transmittance > 70%  
 ITC ≤ 6  
 HCl and HBr < 0.5 %  
 HF < 0.1 %  
 pH > 4.3  
 conductivity < 10 µS / mm

#### Fire performance for rolling stock

vertical flame propagation for bunched wires or cables  
 smoke release

#### NFPA130

FT 4/IEEE 1202  
 UL 1685

carbonisation ≤ 1.5 m  
 peak smoke rate ≤ 0.25 m<sup>2</sup> / s  
 total smoke released ≤ 95 m<sup>2</sup>

#### Material properties

resistance to ozone  
  
 resistance to cold  
 resistance to oil  
 resistance to fuel  
 resistance to acid  
 resistance to alkali  
 low fire load  
 limiting oxygen index (LOI)  
  
 resistance to UV

#### EN 50264-3-1

EN 50264-3-1  
  
 EN 60811-504  
 EN 60811-404  
 EN 60811-404  
 EN 60811-404  
 EN 60811-404  
 DIN 51900  
 ISO 4589-2  
 ASTM D 2863  
 EN 50618

#### hazard level M

72 h / 40 °C, method B  
 volume concentration 200x10<sup>-6</sup>  
 - 40 °C  
 72 h / 100 °C, IRM 902  
 168 h / 70 °C, IRM 903  
 168 h / 23 °C, n-Oxalic acid  
 168 h / 23 °C, n-NaOH  
  
 > 30 %  
 > 30 %  
 > 2000 h

#### Technical prescriptions concerning the burning behaviour

resistance to flame propagation

#### UN/ECE-R 118

ISO 6722-1

combustion duration ≤ 70 sec.  
 length of unburned area ≥ 50 mm

#### Approvals


































Swiss Federal Railways

The national standards as BS 6853, DIN 5510-2, NFF 16-101, PN-K-02511, UNI CEI 11170 had been withdrawn and are replaced by EN 45545-2.

All information regarding properties, technical data, etc. are without obligation. Dimensions and weights are reference values. All information can be changed at any time and without prior notice.

## Dimensions and weights

### BETrans<sup>®</sup> 4 GW-ENX R 1800 V M

cross section [mm <sup>2</sup> ]	part no.	part no.	part no.	part no.	part no.	conductor		Mean thickness	core	R <sub>20</sub>	weight	fire load
	black	light blue	brown	green	yellow	construction	nom.-Ø	of insulation	outer- Ø	[mΩ/m]	approx.	approx.
						[n x mm]	[mm]	[mm]	[mm]		[kg/km]	[kWh/m]
1	312472					32 x 0.20	1.20 ± 0.06	0.80	2.80 ± 0.10	20.00	16	0.030
1.5	312473					30 x 0.25	1.45 ± 0.07	0.875	3.20 ± 0.10	13.70	22	0.037
2.5	312474					50 x 0.25	1.95 ± 0.08	0.875	3.70 ± 0.15	8.21	33	0.046
4	312475					52 x 0.30	2.55 ± 0.08	1.15	4.85 ± 0.15	5.09	54	0.080
6	312476					78 x 0.30	3.10 ± 0.10	1.20	5.50 ± 0.20	3.39	75	0.097
10	312477					74 x 0.40	4.10 ± 0.20	1.30	6.70 ± 0.20	1.95	117	0.132
16	312478					119 x 0.40	5.00 ± 0.20	1.40	7.80 ± 0.30	1.24	174	0.168

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