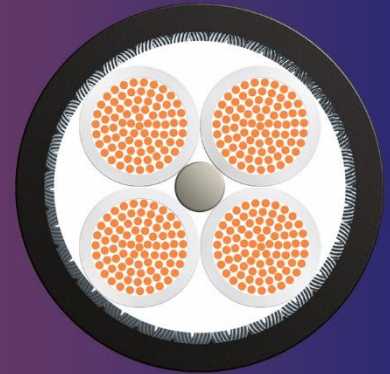
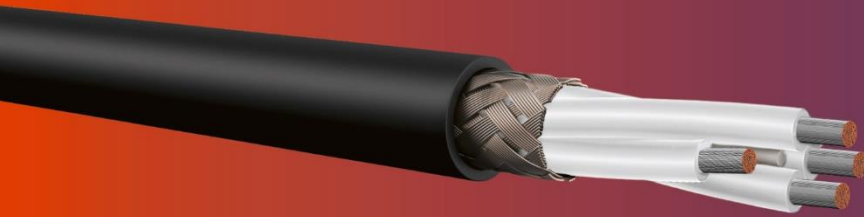


## ROLLING STOCK - SIGNAL AND CONTROL CABLES

# BETAtrans® GWK-ENX C-flex R 600 V MM 105 S

## Screened sheathed multicore cable



## Application

This screened sheathed cable is designed for fixed and protected installations inside and outside of rail vehicles and buses. Due to the very small diameter it is used where space is very limited. For installation the guidelines of EN 50355 and EN 50343 must be considered.

## Construction

Conductor	Tinned fine copper strand acc. to VDE 0295 / IEC 60228, class 5
Insulation	Polyolefin Copolymer, Comp 712, electron beam cross-linked
Colour	White with number imprint, further colours upon request
Shield	Tinned copper braid
Sheath	Polyolefin Copolymer, Comp 752, electron beam cross-linked
Colour	Black

## Advantages

- Halogen free
- Electron beam cross-linked
- Weight and volume-optimised
- Very long lifetime
- Good media resistance
- High level cold resistance
- Infusible
- Low fire load

## Electrical properties

Rated value	U0/U	0.6 / 1 kV AC
Maximum voltage	U0m	0.72 kV AC
Maximum voltage	Um	1.2 kV AC
Maximum voltage	V0	0.9 kV DC
Maximum voltage	Vm	1.8 kV DC
Test voltage		3.5 kV, 50 Hz / 5 min.

## Thermal properties

Max. operating temperature	fixed installation	+125°C
Min. ambient temperature	fixed installation	-40°C
Max. short circuit temperature		+280°C (max. 5s)

## Mechanical properties

Bending radius	fixed installation	$\varnothing < 10 \text{ mm}: > 3 \times \varnothing$ (-40°C)
Bending radius	fixed installation	$\varnothing \geq 10 \text{ mm}: > 4 \times \varnothing$ (-40°C)

## Material properties / Standards

Material properties	EN 50306-4 hazard level MM
Ozone resistant	EN 50305
High resistance to cold	EN 60811-504
High resistance to oil	EN 60811-404
High resistance to fuel	EN 60811-404
Resistance to acid	EN 60811-404
Resistance to alkaline	EN 60811-404

## Material properties / Standards

Low fire load	DIN 51900
Limiting oxygen index (LOI)	ISO 4589-2 ASTM D 2863
Resistance to UV	EN 50618
Fire performance for rolling stock	EN 45545-2 HL1 - HL3
Fire performance for rolling stock	EN 50306-4
Vertical flame propagation for a single insulated wire or cable	EN 60332-1-2
Vertical flame spread of bunched wires or cables $\geq 12 \text{ mm}$	EN 60332-3-24
Vertical flame spread of bunched wires or cables $> 6 < 12 \text{ mm}$	EN 60332-3-25
Vertical flame spread of bunched wires or cables $\leq 6 \text{ mm}$	EN 50305
Smoke density	EN 61034-2
Toxicity of gases	EN 50305
Absence of halogens	EN 60754-1 EN 60684-2
Corrosivity of gases	EN 60754-2
Fire performance for rolling stock	NFPA130
Vertical flame propagation for bunched wires or cables	FT 4/IEEE 1202
Smoke release	UL 1685

## Approvals

Swiss Federal Railways

Construction Cross-sec. [mm <sup>2</sup> ]	Color code	Conductor-Ø [mm]	Shield-Ø [mm]	Cross-sec shield [mm <sup>2</sup> ]	R <sub>20</sub> [mΩ/m]	Outer-Ø [mm]	Weight [kg/km]	Fire load [kWh/m]	Part no.
2 x 0.33	NR	0.75	3.5	1.01	57.2	4.90 ± 0.20	34	0.080	313022
3 x 0.33	NR	0.75	3.7	1.01	57.2	5.10 ± 0.20	40	0.090	313023
4 x 0.33	NR	0.75	4.1	1.01	57.2	5.50 ± 0.20	47	0.100	313025
5 x 0.33	NR	0.75	4.5	1.26	57.2	5.80 ± 0.20	54	0.120	313026
20 x 0.33	NR	0.75	7.1	1.76	57.2	8.90 ± 0.20	143	0.280	*
22 x 0.33	NR	0.75	8.2	1.76	57.2	9.60 ± 0.20	158	0.310	316181
2 x 0.5	NR	0.85	3.7	1.01	40.1	5.10 ± 0.20	38	0.080	312973
3 x 0.5	NR	0.85	3.9	1.01	40.1	5.30 ± 0.20	45	0.090	313032
4 x 0.5	NR	0.85	4.3	1.01	40.1	5.70 ± 0.20	55	0.110	313034
4 x 0.5	rd, gn,bl, ye	0.85	4.3	1.01	40.1	5.70 ± 0.20	55	0.110	316214
5 x 0.5	NR	0.85	4.7	1.26	40.1	6.10 ± 0.20	64	0.130	313035
5 x 0.5	rd, gn,bl, ye, or	0.85	4.7	1.26	40.1	6.10 ± 0.20	64	0.130	317045
5 G 0.5	NRPE	0.85	4.7	1.26	40.1	6.10 ± 0.20	64	0.130	316076
6 x 0.5	NR	0.85	5.2	1.26	40.1	6.60 ± 0.20	74	0.140	313036
7 x 0.5	NR	0.85	5.4	1.51	40.1	6.80 ± 0.20	82	0.160	313037
8 x 0.5	NR	0.85	5.8	1.51	40.1	7.20 ± 0.20	92	0.190	313038
9 x 0.5	NR	0.85	5.9	1.51	40.1	7.30 ± 0.20	94	0.180	313039
10 x 0.5	NR	0.85	5.9	1.51	40.1	7.30 ± 0.20	98	0.180	313040
12 x 0.5	NR	0.85	6.3	1.76	40.1	7.70 ± 0.20	113	0.200	313041
14 x 0.5	NR	0.85	6.7	1.76	40.1	8.10 ± 0.20	127	0.220	313042
15 x 0.5	NR	0.85	7.1	1.76	40.1	8.50 ± 0.20	138	0.250	313043
16 x 0.5	NR	0.85	7.1	1.76	40.1	8.50 ± 0.20	141	0.250	313044
18 x 0.5	NR	0.85	7.6	1.76	40.1	9.00 ± 0.20	158	0.280	317502
22 x 0.5	NR	0.85	8.5	1.76	40.1	9.90 ± 0.30	192	0.340	313045
24 x 0.5	NR	0.85	8.6	1.76	40.1	10.00 ± 0.30	198	0.320	*
25 x 0.5	NR	0.85	9	2.64	40.1	10.40 ± 0.30	212	0.360	313046
27 x 0.5	NR	0.85	9	2.64	40.1	10.40 ± 0.30	220	0.360	313047
36 x 0.5	NR	0.85	10.7	2.64	40.1	12.10 ± 0.30	283	0.470	313048
48 x 0.5	NR	0.85	11.7	2.64	40.1	13.10 ± 0.30	358	0.570	313049
2 x 2 x 0.5	NR	0.85	5.2	1.51	40.1	6.60 ± 0.30	66	0.140	313050
3 x 2 x 0.5	NR	0.85	5.2	1.51	40.1	6.60 ± 0.30	72	0.130	313051
4 x 2 x 0.5	NR	0.85	5.9	1.51	40.1	7.30 ± 0.30	87	0.160	313052
5 x 2 x 0.5	NR	0.85	7.4	1.76	40.1	8.80 ± 0.30	112	0.220	313053
6 x 2 x 0.5	NR	0.85	8.8	1.76	40.1	10.20 ± 0.30	138	0.270	313054
8 x 2 x 0.5	NR	0.85	9.5	2.64	40.1	10.90 ± 0.30	177	0.350	315958

Construction Cross-sec. [mm <sup>2</sup> ]	Color code	Conductor-Ø [mm]	Shield-Ø [mm]	Cross-sec shield [mm <sup>2</sup> ]	R <sub>20</sub> [mΩ/m]	Outer-Ø [mm]	Weight [kg/km]	Fire load [kWh/m]	Part no.
10 x 2 x 0.5	NR	0.85	9.8	2.64	40.1	11.20 ± 0.30	188	0.350	313055
12 x 2 x 0.5	NR	0.85	10.7	2.64	40.1	12.10 ± 0.30	215	0.360	313056
15 x 2 x 0.5	NR	0.85	11.9	2.64	40.1	13.30 ± 0.30	269	0.480	313057
16 x 2 x 0.5	NR	0.85	11.9	2.64	40.1	13.30 ± 0.40	271	0.450	*
19 x 2 x 0.5	NR	0.85	13.5	4.46	40.1	14.90 ± 0.30	343	0.590	*
20 x 2 x 0.5	NR	0.85	13.5	4.46	40.1	14.90 ± 0.30	347	0.570	*
24 x 2 x 0.5	NR	0.85	15.3	4.46	40.1	16.70 ± 0.40	426	0.660	*
1 x 0.75	wh	1.10	2.5	0.63	26.7	3.90 ± 0.20	27	0.060	313058
2 x 0.75	NR	1.10	4.2	1.01	26.7	5.60 ± 0.20	49	0.100	313059
3 x 0.75	NR	1.10	4.5	1.01	26.7	5.90 ± 0.20	57	0.110	313060
3 x 0.75	wh, br, gn	1.10	4.5	1.01	26.7	5.90 ± 0.20	57	0.110	316543
4 x 0.75	NR	1.10	4.9	1.26	26.7	6.30 ± 0.20	68	0.130	313061
5 x 0.75	NR	1.10	5.1	1.51	26.7	6.50 ± 0.20	79	0.140	313062
6 x 0.75	NR	1.10	5.7	1.51	26.7	7.10 ± 0.20	91	0.160	313063
7 x 0.75	NR	1.10	6.1	1.76	26.7	7.50 ± 0.20	106	0.190	313064
8 x 0.75	NR	1.10	6.7	1.76	26.7	8.10 ± 0.20	120	0.230	313065
9 x 0.75	NR	1.10	6.9	1.76	26.7	8.30 ± 0.20	123	0.200	*
10 x 0.75	NR	1.10	6.9	1.76	26.7	8.30 ± 0.20	130	0.200	*
12 x 0.75	NR	1.10	7.4	1.76	26.7	8.80 ± 0.20	149	0.240	313066
14 x 0.75	NR	1.10	7.8	1.76	26.7	9.20 ± 0.20	169	0.250	*
16 x 0.75	NR	1.10	8.3	1.76	26.7	9.70 ± 0.20	191	0.300	313067
18 x 0.75	NR	1.10	8.9	1.76	26.7	10.30 ± 0.30	214	0.310	'
20 x 0.75	NR	1.10	9.4	2.64	26.7	10.80 ± 0.30	236	0.370	317041
22 x 0.75	NR	1.10	9.9	2.64	26.7	11.30 ± 0.30	259	0.390	*
24 x 0.75	NR	1.10	10.1	2.64	26.7	11.50 ± 0.30	268	0.370	*
27 x 0.75	NR	1.10	10.6	2.64	26.7	12.00 ± 0.30	298	0.410	*
36 x 0.75	NR	1.10	12.1	2.64	26.7	13.50 ± 0.30	385	0.540	*
48 x 0.75	NR	1.10	13.9	4.46	26.7	15.30 ± 0.30	506	0.670	*
2 x 2 x 0.75	NR	1.10	6.3	1.76	26.7	7.70 ± 0.30	85	0.180	313068
2 x 0.75	NR	1.10	11.1	2.64	26.7	12.80 ± 0.40	185	0.450	317182
5 x 0.75	NR	1.10	14.2	7.54	26.7	15.90 ± 0.20	334	0.700	317183
2 x 1	NR	1.20	4.6	4.6	20	6.00 ± 0.20	54	0.100	313071
3 x 1	NR	1.20	4.9	4.9	20	6.30 ± 0.20	67	0.120	313072
4 x 1	NR	1.20	5.2	5.2	20	6.60 ± 0.20	90	0.180	313073
5 x 1	NR	1.20	5.7	5.7	20	7.10 ± 0.20	95	0.160	313074

Construction Cross-sec. [mm <sup>2</sup> ]	Color code	Conductor-Ø [mm]	Shield-Ø [mm]	Cross-sec shield [mm <sup>2</sup> ]	R <sub>20</sub> [mΩ/m]	Outer-Ø [mm]	Weight [kg/km]	Fire load [kWh/m]	Part no.
6 x 1	NR	1.20	6.3	6.3	20	7.70 ± 0.20	113	0.200	313075
6 x 1	rd, bl, wh, bk, gy, br	1.20	6.3	6.3	20	7.70 ± 0.20	113	0.200	316530
7 x 1	NR	1.20	6.9	6.9	20	8.30 ± 0.20	130	0.230	313076
8 x 1	NR	1.20	7.4	7.4	20	8.80 ± 0.20	148	0.270	313078
9 x 1	NR	1.20	7.7	7.7	20	9.10 ± 0.20	153	0.240	*
10 x 1	NR	1.20	7.7	7.7	20	9.10 ± 0.20	162	0.240	316766
12 x 1	NR	1.20	8.2	8.2	20	9.60 ± 0.20	187	0.290	313079
14 x 1	NR	1.20	8.7	8.7	20	10.10 ± 0.30	212	0.320	313080
16 x 1	NR	1.20	9.3	9.3	20	10.70 ± 0.30	242	0.360	313081
18 x 1	NR	1.20	9.9	9.9	20	11.30 ± 0.30	270	0.390	*
22 x 1	NR	1.20	11	11	20	12.40 ± 0.30	326	0.500	313082
24 x 1	NR	1.20	11.3	11.3	20	12.70 ± 0.30	339	0.460	316767
27 x 1	NR	1.20	11.8	11.8	20	13.20 ± 0.30	376	0.510	*
36 x 1	NR	1.20	13.6	13.6	20	15.00 ± 0.30	502	0.670	*
48 x 1	NR	1.20	15.5	15.5	20	16.90 ± 0.30	644	0.830	*
2 x 2 x 1	NR	1.20	6.95	6.95	20	8.35 ± 0.30	100	0.210	313083
4 x 2 x 1	NR	1.20	8.3	8.3	20	9.70 ± 0.30	142	0.230	313084
8 x 2 x 1	NR	1.20	12.4	12.4	20	13.80 ± 0.30	295	0.540	316650
10 x 2 x 1	NR	1.20	12.9	12.9	20	14.30 ± 0.30	310	0.470	316651
12 x 2 x 1	NR	1.20	13.1	13.1	20	14.50 ± 0.30	358	0.520	313085
2 x 3 x 1	NR	1.20	8.2	8.2	20	9.30 ± 0.30	136	0.260	316269
3 x 4 x 1	NR	1.20	9.9	9.9	20	11.30 ± 0.30	224	0.400	313086
1 x 1.5	wh	1.45	2.8	0.75	13.7	4.20 ± 0.20	35	0.060	313088
2 x 1.5	NR	1.45	5	1.26	13.7	6.40 ± 0.20	69	0.130	313089
3 x 1.5	NR	1.45	5.3	1.51	13.7	6.70 ± 0.20	84	0.130	313090
3 G 1.5	NRPE	1.45	5.3	1.51	13.7	6.70 ± 0.20	84	0.130	313091
4 x 1.5	NR	1.45	5.9	1.51	13.7	7.30 ± 0.20	103	0.170	313092
4 G 1.5	NRPE	1.45	5.9	1.51	13.7	7.30 ± 0.20	103	0.170	313093
5 x 1.5	NR	1.45	6.6	1.76	13.7	8.00 ± 0.20	127	0.200	313094
5 G 1.5	NRPE	1.45	6.6	1.76	13.7	8.00 ± 0.20	127	0.200	313095
6 x 1.5	NR	1.45	7.3	1.76	13.7	8.70 ± 0.20	149	0.240	313096
7 x 1.5	NR	1.45	8	1.76	13.7	9.40 ± 0.20	174	0.280	313097
7 G 1.5	NRPE	1.45	8	1.76	13.7	9.40 ± 0.20	174	0.280	313098
8 x 1.5	NR	1.45	8.7	1.76	13.7	10.10 ± 0.30	201	0.340	312972
9 x 1.5	NR	1.45	9.1	2.64	13.7	10.50 ± 0.30	211	0.320	313099

Construction Cross-sec. [mm <sup>2</sup> ]	Color code	Conductor-Ø [mm]	Shield-Ø [mm]	Cross-sec shield [mm <sup>2</sup> ]	R <sub>20</sub> [mΩ/m]	Outer-Ø [mm]	Weight [kg/km]	Fire load [kWh/m]	Part no.
10 x 1.5	NR	1.45	9.1	2.64	13.7	10.50 ± 0.30	221	0.310	313100
12 x 1.5	NR	1.45	9.6	2.64	13.7	11.00 ± 0.30	256	0.360	313102
14 x 1.5	NR	1.45	10.2	2.64	13.7	11.60 ± 0.30	291	0.400	313103
16 x 1.5	NR	1.45	10.9	2.64	13.7	12.30 ± 0.30	331	0.460	313104
18 x 1.5	NR	1.45	11.6	2.64	13.7	13.00 ± 0.30	371	0.520	313105
22 x 1.5	NR	1.45	13	2.64	13.7	14.40 ± 0.30	454	0.630	316632
24 x 1.5	NR	1.45	13.7	4.46	13.7	15.10 ± 0.30	484	0.610	*
25 x 1.5	NR	1.45	14.1	4.46	13.7	15.50 ± 0.30	514	0.680	*
27 x 1.5	NR	1.45	14.1	4.46	13.7	15.50 ± 0.30	535	0.670	316995
36 x 1.5	NR	1.45	16	4.46	13.7	17.40 ± 0.30	697	0.880	*
37 x 1.5	NR	1.45	16.7	4.46	13.7	18.10 ± 0.30	737	0.990	312974
48 x 1.5	NR	1.45	18.5	5.94	13.7	19.90 ± 0.40	914	1.110	317640
2 x 2 x 1.5	NR	1.45	8.3	1.76	13.7	9.70 ± 0.30	135	0.270	313106
2 x 2.5	NR	1.95	6.1	1.76	8.21	7.50 ± 0.20	100	0.170	313114
3 x 2.5	NR	1.95	6.5	1.76	8.21	7.90 ± 0.20	119	0.170	313115
3 G 2.5	NRPE	1.95	6.5	1.76	8.21	7.90 ± 0.20	119	0.170	313116
4 x 2.5	NR	1.95	7.3	1.76	8.21	8.70 ± 0.20	152	0.210	313117
4 G 2.5	NRPE	1.95	7.3	1.76	8.21	8.70 ± 0.20	152	0.210	313119
5 x 2.5	NR	1.95	8.1	1.76	8.21	9.50 ± 0.20	185	0.260	313132
6 x 2.5	NR	1.95	8.9	1.76	8.21	10.20 ± 0.30	220	0.310	313134
7 x 2.5	NR	1.95	9.8	2.64	8.21	11.20 ± 0.30	259	0.370	313137
8 x 2.5	NR	1.95	10.7	2.64	8.21	12.10 ± 0.30	300	0.450	313139
9 x 2.5	NR	1.95	11.3	2.64	8.21	12.70 ± 0.30	310	0.390	*
10 x 2.5	NR	1.95	11.3	2.64	8.21	12.70 ± 0.30	331	0.380	*
12 x 2.5	NR	1.95	11.9	2.64	8.21	13.30 ± 0.30	387	0.430	*
14 x 2.5	NR	1.95	12.7	2.64	8.21	14.10 ± 0.30	442	0.490	*
16 x 2.5	NR	1.95	13.6	4.46	8.21	15.00 ± 0.30	514	0.570	*
18 x 2.5	NR	1.95	14.4	4.46	8.21	15.80 ± 0.30	576	0.640	*
22 x 2.5	NR	1.95	16.2	4.46	8.21	17.60 ± 0.30	707	0.820	*
24 x 2.5	NR	1.95	16.8	4.46	8.21	18.20 ± 0.30	737	0.770	*
27 x 2.5	NR	1.95	17.4	4.46	8.21	18.80 ± 0.30	818	0.850	*
36 x 2.5	NR	1.95	19.9	5.94	8.21	21.30 ± 0.40	1088	1.130	*
48 x 2.5	NR	1.95	22.9	7.92	8.21	24.30 ± 0.40	1433	1.410	*

Note:

\* Upon request

FELTEN Wire and Cable Solutions BV reserves the right to make changes to the product described in this specification without prior notice. FELTEN does not assume any liability which may occur due to the use of the specification described herein. Drawings are not to scale unless otherwise specified and are provided for general and informational purposes only. All values represented in this specification should be used as a guide only and exact product details can be confirmed at point of enquiry.