

Cable Solutions for **RAILWAYS**

PRODUCT OVERVIEW



B3 Cable Solutions lead the world in cable manufacturing, with a presence in Europe, Asia and the Middle East. As the fastest growing cable manufacturer in the world, B3 now operate in more market sectors and countries than ever before, delivering innovative value added services alongside an extensive range of cable products.

B3 serves a prestigious global customer base with cabling products and world-class value added services to the following market sectors:

- Railways ■ Communications ■ Utilities ■ Building ■ Industrial

B3's product range is extensive and delivers quality approved products for a wide variety of applications. The company has a unique blend of business skills, industry knowledge and continuous improvement expertise to create and deliver a portfolio of innovative value added services. B3's portfolio has been developed with the benefit and feedback of real life customer experiences. Customers use a range of products and solutions to streamline processes, reduce overhead and logistics costs and improve the efficiency of their cable supply chain.

B3's manufacturing facilities and rail cable products are of the highest quality, but what sets B3 apart is world class service. If you're looking for any of these rail cabling solutions, then you should talk to B3:

- Trackside communications ■ Signalling ■ Axle counting/safety
- Low voltage power ■ Optical fibre ■ Hybrid cables

Visit B3 at www.b3cables.com or contact your local office (see back page for details).

This brochure represents only a small selection of the products B3 can supply.

TRACKSIDE SIGNALLING

Typical Cable Applications:

Signalling circuits in railway networks

ZPFU (with mechanical protection)

Compliant with French Railway Standards (Société Nationale des Chemins de Fer) SNCF CT 445 & NF C 32-070 Category C2 1.13 mm plain copper wire with solid Pe insulation, twisted pair, helically stranded cable core, plastic tape core wrap Pe inner sheath, 2 x helically applied steel tapes, PVC outer sheath

B3 P/N	No. of Pairs	Max DC Cond. Resistance (ohm/km)	Maximum Mutual Capacitance (nF/km)	Maximum Cap. Unbalance (pF/500 m)	Insulation Resistance (m.ohm/km)	Nominal Overall Diameter (mm)	Nominal Weight (kgs/km)
10138998	4	18.1	55	400	5000	16.1	510
10139001	21	18.1	55	400	5000	27.8	1300

Please note: The above cables are available in the range 1 - 56 pairs and with a Low Smoke Zero Halogen Sheath

ZPAU (with induction and electromagnetic protection)

Compliant with French Railway Standards (Société Nationale des Chemins de Fer) SNCF CT 445 & NF C 32-070 Cat C2 1.13 mm plain copper wire with solid Pe insulation, twisted pair, helically stranded cable core, plastic tape core wrap Pe inner sheath, corrugated copper tape, Pe intermediate sheath, 2 x helically applied steel tapes, PVC outer sheath

B3 P/N	No. of Pairs	Max DC Cond. Resistance (ohm/km)	Maximum Mutual Capacitance (nF/km)	Maximum Cap. Unbalance (pF/500 m)	Reduction Factor @ 50Hz (100V/km)	Nominal Overall Diameter (mm)	Nominal Weight (kgs/km)
10180391	4	18.1	55	400	0.26	20.1	840
10180637	21	18.1	55	400	0.26	31.7	1800

Please note: The above cables are available in the range 4 - 56 pairs and with a Low Smoke Zero Halogen Sheath compliant to NF C 32-070 Category C1

ZC03 (with electrostatic and electromagnetic protection)

Compliant with French Railway Standards (Société Nationale des Chemins de Fer) SNCF CT 445 & NF C 32-070 Cat C2 1.13 mm plain copper wire with solid Pe insulation, quad construction, helically stranded cable core, plastic tape core wrap Pe inner sheath, 2 x helically applied steel tapes, PVC outer sheath

B3 P/N	No. of Pairs	Max DC Cond. Resistance (ohm/km)	Maximum Mutual Capacitance (nF/km)	Maximum Cap. Unbalance (pF/500 m)	Reduction Factor @ 50Hz (100V/km)	Nominal Overall Diameter (mm)	Nominal Weight (kgs/km)
10180434	4	18.1	40	400	0.21	27.0	1300

Please note: The above cable is available with a Low Smoke Zero Halogen Sheath compliant to NF C 32-070 Cat C1



AJ-2Y2YDB2Y H115/H145 rk 501 Series (with induction and electromagnetic protection)

Compliant with German Railway Standards (Deutsche Bahn) Dlk 1.013.107y & Dlk 1.013.110y

Plain copper wire of 0.9, 1.4 or 1.8 mm diameter with solid Pe insulation, helically stranded into concentric layers, plastic tape core wrap Pe inner sheath, 1 x layer of helically applied copper wires, 2 x helically applied steel tapes, Pe outer sheath

B3 P/N	No. of Cores	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Maximum Conductor Capacitance (nF/km)	Reduction Factor @ 50Hz (100V/km)	Nominal Overall Diameter (mm)	Nominal Weight (kgs/km)
10180638	50	0.9	28.9	115	0.35	22.5	1000
10180639	120	1.4	11.9	145	0.35	36.9	3850
10180640	200	1.8	7.2	145	0.35	55.5	7200

Please note: The above cables are available in the range 10 - 200 cores and without induction protection

A2Y(L)2YV S

Compliant with German Railway Standards (Deutsche Bahn) Dlk 1.013.109y & Dlk 1.013.110y Plain copper wire of 0.9 or 1.4 mm with solid Pe insulation, quad construction, helically stranded cable core, plastic tape core wrap Pe sheath incorporating a longitudinally applied aluminium-copolymer tape with overlap

B3 P/N	No. of Cores	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Maximum Conductor Capacitance (nF/km)	Insulation Resistance (m.ohm/km)	Nominal Overall Diameter (mm)	Nominal Weight (kgs/km)
10180632	5	0.9	28.3	45	10000	15.9	270
10180628	20	1.4	11.7	45	10000	38	1720

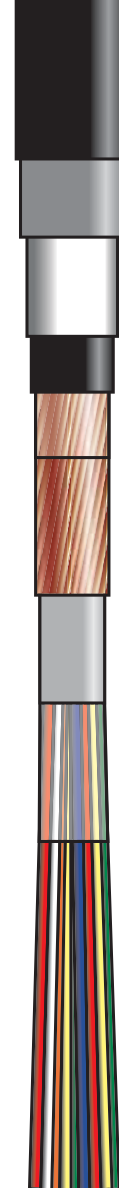
Please note: The above cables are available in the range 1 - 40 quads and with reduction protection

15ECWF (with mechanical protection)

Compliant with Spanish Railway Standards (Administrador de Infraestructuras Ferroviarias) ADIF E.T. 03.365.051.6 Plain copper wire of 1.4 mm diameter with solid Pe insulation, helically stranded into concentric layers, plastic tape core wrap Pe inner sheath incorporating a longitudinally applied aluminium-copolymer tape with overlap, 1 x longitudinally applied corrugated steel tape, Pe sheath

B3 P/N	No. of Cores	Conductor Gauge (mm)	Nominal Sheath Radial (mm)	Max DC Cond. Resistance (ohm/km)	Insulation Resistance (m.ohm/km)	Nominal Overall Diameter (mm)	Nominal Weight (kgs/km)
10138897	12	1.4	1.4	11.9	35000	18.2	450
10180641	100	1.4	1.5	11.9	35000	38.2	2000

Please note: The above cables are available in the range 4 - 100 cores and with reduction protection



15/19EXEF Series 400 (with electrostatic & electromagnetic protection)

Compliant with Spanish Railway Standards (Administrador de Infraestructuras Ferroviarias) ADIF E.T. 03.365.051.6 Plain copper wire of 0.9 or 1.4 mm with solid Pe insulation, quad construction, helically stranded cable core, plastic tape core wrap Pe inner sheath, 1 x helically applied layer of copper wires or one corrugated steel tape, 2 x helically applied steel tapes, Pe sheath

B3 P/N	No. of Quads	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Maximum Mutual Capacitance (nF/km)	Insulation Resistance (m.ohm/km)	Nominal Overall Diameter (mm)	Nominal Weight (kgs/km)
10139175	10	0.9	29	45	35000	29.2	1435
10180642	27	1.4	11.7	48	35000	52.3	4000

Please note: The above cables are available in the range 1 - 48 quads and with reduction protection

RT/F3 Axle Counter (with mechanical protection)

Compliant with English Railway Standard (Network Rail) RT/E/PS/00031 & HFFR Cables IEC60332-3 (flammability) & IEC 61034 (smoke emission) Tinned copper wire of 0.9 or 1.4 mm with solid Pe insulation, twisted pair construction, helically stranded cable core, plastic tape core wrap Pe inner sheath incorporating a longitudinally applied aluminium-copolymer tape, corrugated steel tape armour, Halogen Free Flame Retardant (HFFR) sheath

B3 P/N	No. of Pairs	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Maximum Mutual Capacitance (nF/km)	Max Average Attenuation @ 1 kHz (dB/km)	Minimum Average NEXT @ 1 kHz (dB/km)	Nominal Overall Diameter (mm)
10139119	2	0.9	30	42 ± 3	0.73	60	22
10180644	10	1.4	12.5	47 ± 3	0.45	60	30.4

Please note: The above cables are available in the range 2 - 24 pairs

XPS & XPZ Axle Counter (with rodent protection)

Compliant with English Railway Standard (Network Rail) NR/L2/SIG/30060, in addition HFFR (XPZ) cables meet BS 6724, IEC 60754, IEC 60332-1 Tinned copper wire of 0.9 or 1.4 mm with solid Pe insulation, twisted pair construction, helically stranded cable core, plastic tape core wrap, woven glass fibre tape, Pe sheath incorporating a longitudinally applied aluminium-copolymer tape applied with overlap Options: Corrugated steel tape armour, brass tape armour, Halogen Free Flame Retardant (HFFR) sheath

B3 P/N	No. of Pairs	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Maximum Mutual Capacitance (nF/km)	Max Average Attenuation @ 40 kHz (dB/km)	Characteristic Impedance @ 90 kHz (ohms)	Nominal Overall Diameter (mm)
10180606	2	0.9	30	45	2.6	135 ± 10	22
10180595	10	1.4	12.5	50	2.0	135 ± 10	30.4

Please note: The above cables are available in the range 2 - 24 pairs

K23 Metro (with mechanical protection)

Compliant with French Railway Standards (Société Nationale des Chemins de Fer) NF F 55-623 & NF C 32-070 Category C1 Plain copper wire of 0.6, 0.8, 1.0 or 1.2 mm with solid Pe insulation, quad construction, helically or oscillated stranded cable core, plastic tape core wrap Halogen Free Flame Retardant (HFFR) inner sheath incorporating a longitudinally applied aluminium-copolymer tape, 2 x helically applied steel tapes and a Halogen Free Flame Retardant (HFFR) outer sheath

B3 P/N	No. of Pairs	Conductor Gauge (mm)	Minimum Outer Sheath Radial (mm)	Max DC Cond. Resistance (ohm/km)	Insulation Resistance (m.ohm/km)	Nominal Overall Diameter (mm)	Nominal Weight (kgs/km)
10180645	8	0.6	1.0	64	5000	16.5	330
10139254	14	0.8	1.4	36	5000	20.5	380
10074425	28	1.0	1.6	23	5000	29.0	940
10074432	14	1.2	1.4	16	5000	25.0	725

Please note: The above cables are available in the range 2 - 896 pairs

Metro DIGICODE-INDOOR (with mechanical protection)

Halogen Free Flame Retardant version compliant with EN 50-266-2-4, IEC 60332-3, EN 50268-2, EN50267

Plain copper wire of 1.4 mm with solid Pe insulation, twin construction, helically stranded cable core, plastic tape core wrap Halogen Free Flame Retardant (HFFR) inner sheath incorporating a longitudinally applied aluminium-copolymer tape, 2 x helically applied steel tapes and a Halogen Free Flame Retardant (HFFR) outer sheath

B3 P/N	No. of Pairs	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Maximum Mutual Pair Capacitance (nF/km)	Minimum NEXT @ 20.7 KHz (dB/km)	Minimum FEXT @ 20.7 KHz (dB/km)	Nominal Overall Diameter (mm)
10180653	1*	0.7	12.1	45	42	48	17.9
10180115	2*	0.7	12.1	45	42	48	19.2
10180646	3	0.7	12.1	45	42	48	20.2

Pair sizes marked with an asterisk (*) have an additional auxiliary pair of 0.6 mm conductor gauge



RAILWAY/METRO TELECOMMUNICATIONS CABLE

Typical Cable Applications:

Communications in railway networks

G7622 Type 1

Compliant with London Underground specification LUL G7622 A2 Type 1 Plain copper wire of 0.63 or 0.9 mm with cellular Pe insulation, quad construction, helically or oscillated stranded cable core, plastic tape core wrap, black Pe inner sheath incorporating a longitudinally applied aluminium-copolymer tape, violet PVC outer sheath

B3 P/N	No. of Pairs	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Insulation Resistance (m.ohm/km)	Maximum Mutual Capacitance (nF/km)	Nominal Overall Diameter (mm)	Nominal Weight (kgs/km)
10139296	8	0.63	59	1500	59	16.3	275
10148632	28	0.63	59	1500	59	20.8	480
10139297	54	0.90	29	1500	59	31.4	1150
10139298	74	0.90	29	1500	59	34.8	1460

Please note: The above cables are available in the range 8 - 104 pairs

G7622 Type 2

Compliant with London Underground specifications LUL G7622 A2 Type 2, E4156 Pts 1 & 2, LUL 2-01001-002 A1 Plain copper wire of 0.63 or 0.9 mm with cellular Pe insulation, quad construction, helically or oscillated stranded cable core, plastic tape core wrap, a longitudinally applied aluminium-copolymer tape and a violet Halogen Free Flame Retardant (HFFR) sheath

B3 P/N	No. of Pairs	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Insulation Resistance (m.ohm/km)	Maximum Mutual Capacitance (nF/km)	Nominal Overall Diameter (mm)	Nominal Weight (kgs/km)
10139300	8	0.63	59	1500	59	11.5	181
10139302	28	0.63	59	1500	59	16.0	367
10139304	54	0.90	29	1500	59	26.6	1050
10139305	74	0.90	29	1500	59	30.0	1350

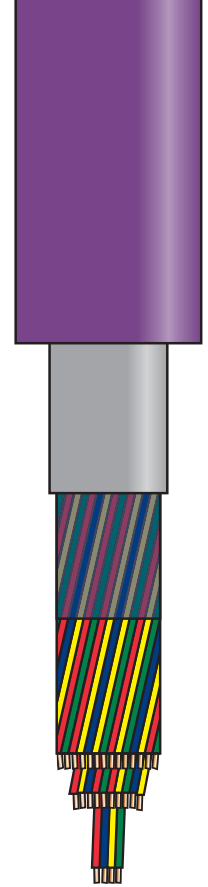
Please note: The above cables are available in the range 8 - 104 pairs

BR884

Compliant with British Rail Telecommunications (BRT) specification BR884 Issue 2 (May 1995) Plain copper wire of 0.63, 0.9 or 1.27 mm with solid Pe insulation, quad construction, helically or oscillated stranded cable core, paper tape core wrap, black Pe sheath incorporating a longitudinally applied aluminium-copolymer tape

B3 P/N	No. of Pairs	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Insulation Resistance (G.ohm/km)	Nominal Mutual Capacitance (nF/km)	Maximum Overall Diameter (mm)	Nominal Weight (kgs/km)
10180670	14	0.63	57	44	41 ± 3.3	17.8	230
10180671	24	0.63	57	44	41 ± 3.3	21.1	335
10139158	38	0.90	28	44	41 ± 3.3	30.2	821
10139159	54	0.90	28	44	41 ± 3.3	34.5	1107
10180672	8	1.27	14	44	41 ± 3.3	22.9	420
10180673	28	1.27	14	44	41 ± 3.3	34.3	1160

Please note: The above cables are available in the range 14 - 308 pairs



BR1916

Compliant with British Rail Telecommunications (BRT) specification BR1916 Issue 2 (May 1995) Plain copper wire of 0.63 or 0.9 mm with solid Pe insulation, twisted pair construction, helically stranded cable core, water swellable tape core wrap, black Halogen Free Flame Retardant (HFFR) sheath incorporating a longitudinally applied aluminium-copolymer tape

B3 P/N	No. of Pairs	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Insulation Resistance (m.ohm/km)	Max Ave Mutual Capacitance (nF/km)	Maximum Overall Diameter (mm)	Nominal Weight (kgs/km)
10142153	10	0.63	60	1500	61	15.5	270
10142184	50	0.63	60	1500	61	24.0	700
10180674	30	0.90	30	1500	65	25.0	800
10180675	75	0.90	30	1500	65	36.0	1560

Please note: The above cables are available in the range 2 - 100 pairs

Options: Steel tape armour to BR1822



TS0886

Compliant with British Rail Telecommunications (BRT) specification TS0886 Issue 3 (April 1995)

Plain copper wire of 0.63 or 0.9 mm with solid Pe insulation, twisted pair construction, petroleum jelly filled, helically stranded 10 pair units, non-hygroscopic or paper tape core wrap, black Pe sheath incorporating a longitudinally applied aluminium-copolymer tape

B3 P/N	No. of Pairs	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Insulation Resistance (m.ohm/km)	Max Ave Mutual Capacitance (nF/km)	Maximum Overall Diameter (mm)	Nominal Weight (kgs/km)
10180677	30	0.63	60	1500	67	17.1	340
10180676	50	0.63	60	1500	67	20.7	530
10180679	30	0.90	30	1500	75	22.2	605
10180678	50	0.90	30	1500	75	26.3	960

Please note: The above cables are available in the range 2 - 100 pairs

Options: Halogen Free Flame Retardant (HFFR) sheath, steel tape armour to BR1822

NR/PS/TEL/00015

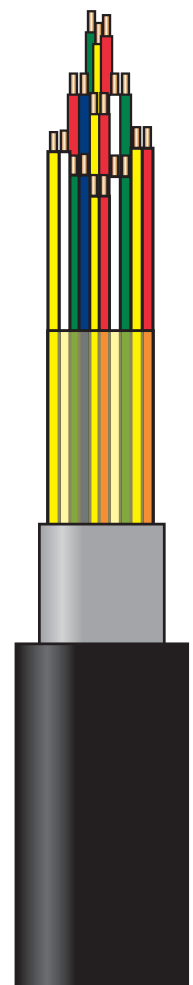
Compliant with Network Rail specification NR/PS/TEL/00015 Issue 3 (April 2006)

Plain copper wire of 0.63 or 0.9 mm with solid Pe insulation, twisted pair construction, petroleum jelly filled, helically stranded 10 pair units, non-hygroscopic or paper tape core wrap, black Pe sheath incorporating a longitudinally applied aluminium-copolymer tape

B3 P/N	No. of Pairs	Conductor Gauge (mm)	Max DC Cond. Resistance (ohm/km)	Maximum Mutual Pair Capacitance (nF/km)	Min NEXT Between Pairs (in same unit) @ 1.024 MHz (dB/km)	Max Average Attenuation @ 1.024 MHz (dB/km)	Nominal Weight (kgs/km)
10180680	20	0.63	60	79	40	18.7	18.1
10180655	50	0.63	60	75	40	18.7	24.2
10180681	20	0.90	30	81	40	14.6	21.9
10180656	50	0.90	30	85	40	14.6	30.0

Please note: The above cables are available in the range 2 - 100 pairs

Options: Halogen Free Flame Retardant (HFFR) sheath, steel tape armour to BR1822



ZUG Internal Cable

Compliant with French Railway Standards (Société Nationale des Chemins de Fer) SNCF CT 445 & NF C 32-070
 Category C2 Stranded tinned copper wire with PVC insulation, twisted pair, helically stranded cable core, plastic tape core wrap with flame retardant PVC sheath

B3 P/N	No. of Pairs	Conductor Cross Section (mm ²)	Max Loop DC Cond. Resistance (ohm/km)	Sheath Thickness (mm)	Nominal Overall Diameter (mm)	Nominal Weight (kgs/km)
	28	0.38	52.5	0.7	15.7	310.0
10180684	1	1.0	20.1	0.7	7.0	60.0
10180683	3	1.0	20.1	0.7	9.9	110.0
10180657	6	1.0	20.1	0.7	12.4	185.0
10180682	12	1.0	20.1	0.7	15.7	340.0

Options: ZUT Type - Electrostatic Protection (Tinned Copper braid)

SUG Type - Individual core conductors (no twisting)

Note: All cables are available in a Halogen Free Flame Retardant (HFFR) sheath



OPTICAL FIBRE TELECOMMUNICATIONS CABLE

Dielectric Loose Tube

Dielectric strength member, gel filled loose tubes with 2 - 16 singlemode fibres per tube (G.652), fillers where required for cable geometry, water swellable elements of tapes or yarns, Pe inner sheath (optional), peripheral strength elements of aramid or glass, Pe outer sheath

B3 P/N	No. of Fibres	No. of Tubes	No. of Fibres Per Tube	Cable Diameter (mm)	Min Bend Radius (mm)
016-SM2-LT04-D-WST-PKP	16	4	4	12.5	187.5
032-SM2-LT08-D-WST-PKP	32	4	8	12.5	187.5
048-SM2-LT08-D-WST-PKP	48	6	8	12.5	187.5
096-SM2-LT08-D-WST-PKP	96	12	8	17.0	255.0
192-SM2-LT16-D-WST-PKP	192	12	16	20.0	300.0

Please note: The above cables are available in the range 8 - 256 fibres, with a double sheath option

The cables have been tested to show compliance with European Norm (EU) 187000.

501 - Max Tensile Load, 504 - Crush Values, 513 - Bend, 601 - Temperature Cycling, and 605B - Water Penetration

Metallic Loose Tube

Dielectric strength member, gel filled loose tubes with 2 - 16 singlemode fibres per tube (G.652), fillers where required for cable geometry, water swellable elements of tapes or yarns, Pe inner sheath (optional), laminated steel tape, Pe outer sheath

B3 P/N	No. of Fibres	No. of Tubes	No. of Fibres Per Tube	Cable Diameter (mm)	Min Bend Radius (mm)
016-SM2-LT04-D-WST-PESP	16	4	4	13.0	260.0
032-SM2-LT08-D-WST-PESP	32	4	8	13.0	260.0
048-SM2-LT08-D-WST-PESP	48	6	8	13.0	260.0
096-SM2-LT08-D-WST-PESP	96	12	8	18.0	360.0
192-SM2-LT16-D-WST-PESP	192	12	16	21.0	420.0

Please note: The above cables are available in the range 8 - 256 fibres, with a double sheath option

The cables have been tested to show compliance with European Norm (EU) 187000.

501 - Max Tensile Load, 504 - Crush Values, 513 - Bend, 601 - Temperature Cycling, and 605B - Water Penetration

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