

# Railway Cables

General Catalogue



## LINKING THE FUTURE

As the worldwide leader in the cable industry, Prysmian Group believes in the effective, efficient and sustainable supply of energy and information as a primary driver in the development of communities.

With this in mind, we provide major global organisations in many industries with best-in-class cable solutions, based on state-of-the-art technology. Through two renowned commercial brands – Prysmian and Draka – based in more than 50 countries, we're constantly close to our customers, enabling them to further develop the world's energy and telecoms infrastructures, and achieve sustainable, profitable growth.

In our energy business, we design, produce, distribute and install cables and systems for the transmission and distribution of power at low, medium, high and extra-high voltage.

In telecoms, the Group is a leading manufacturer of all types of copper and fibre cables, systems and accessories – covering voice, video and data transmission.

Drawing on over 130 years' experience and continuously investing in R&D, we apply excellence, understanding and integrity to everything we do, meeting and exceeding the precise needs of our customers across all continents, at the same time shaping the evolution of our industry.

## What links global expertise to the wheels of industry?

High-performing cable solutions to keep the wheels of industry turning.

On every continent, in applications that range from rolling stock and vehicles for high-speed trains and urban mass transit lines, to all types of rail transport infrastructure, Prysmian's specialist cable solutions sit at the heart of significant international projects; supporting the work of major customers, with high-performing, durable and safe technology.

As the world leader in cabling, we draw on global expertise and local presence to work in close proximity with our customers, delivering products and service platforms built on easy contact, bespoke solutions and effective supply chain, meeting their specialised requirements, to help them drive the wheels of industry and achieve sustainable growth and profitability.

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# Symbols

## Ambient temperature



Permissible ambient temperature ranges.  
[ °C during installation ]  
[ °C during operation and storage ]

## Short circuit temperature



Maximum permissible short circuit temperature at conductor.  
[ °C ]

## Fire behaviour



According to  
EN/IEC 60332-1 flame retardant  
EN/IEC 60332-3-24 fire retardant  
EN/IEC 50200 fire resistant (only if applicable)

## Smoke emission



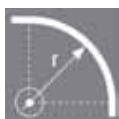
According to  
EN/IEC 61034

## Toxicity



According to  
EN/IEC 60754-1

## Bending radius - Fixed installation



Minimum bending radius for installed cables in fixed applications.  
[ for multiple bending ]  
[ for final bending ]  
D = outer cable diameter

# Cables for Railway Infrastructure

## Applications

### Power Cables

Typical applications are track feeder cables, earthing cables, catenary and overhead power supplies. In certain countries, power cables still are used for light signals and point machines, especially in older rail networks with relay interlocking.

### Signalling Cables

Electronic interlocking requires signalling cables with defined electrical characteristics, for example mutual capacitance, attenuation or impedance. These advanced cable designs are used to connect light signals, point machines, track magnets, balises and other track side equipment to the electronic interlocking central.

### Communication Cables

Typical applications for communication cables are telephone services, emergency telephone sets along the track and GSM-R (Global System for Mobile Communications - Railway) technology.

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# Cables by country

Germany

Spain

France

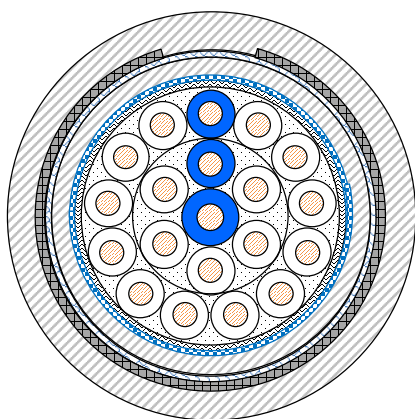
Switzerland

Turkey

# Signalling Cable

## A-2YOF(L)2YB2Y (H115/H145)

n x 1 x 0.9 mm / 1.4 mm / 1.8 mm



### APPLICATION

For railway signalling applications, wiring of light signals, point machines and similar wayside equipment, up to 420 V AC / 600 V DC.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm or 1.4 mm or 1.8 mm of diameter

#### Insulation

PE, natural coloured, with one blue marker core in each layer

#### Twisting

Cores laid up in layers

#### Filling

Special filling compound

#### Moisture barrier sheath

Laminated sheath made of aluminium tape 0.15 mm, one side copolymer coated, bonded with

#### Inner sheath

PE, black

#### Armouring

One layer of galvanized steel tape 0.2 mm, helically applied

#### Outer sheath

PE, black



-10°C; +60°C  
-40°C; +60°C

≥ 10 x D  
≥ 7.5 x D

EN/IEC  
61034

### Notes

- Optional without armouring as A-2YOF(L)2YV and with protection against inductive interference as AJ-2YOF(L)2YDB2Y.
- Detailed data sheet available upon request.



- > Signalling cable acc. to PH 416.0113 V2.1 of Deutsche Bahn
- > Logitudinally water tight
- > Core stranded, steel tape armoured

Characteristics	unit	0.9 mm	1.4 mm	1.8 mm
Conductor resistance	$\Omega/\text{km}$	$\leq 28.9$	$\leq 11.9$	$\leq 7.2$
Insulation resistance	$\text{G}\Omega\text{xkm}$	$\geq 1.5$	$\geq 1.5$	$\geq 1.5$
Mutual capacitance at 800 Hz	$\text{nF}/\text{km}$	$\leq 115$ <sup>1)</sup>	$\leq 145$ <sup>2)</sup>	$\leq 145$ <sup>2)</sup>
Operating voltage DC/AC	V	$\leq 600 / \leq 420$	$\leq 600 / \leq 420$	$\leq 600 / \leq 420$
Test voltage at 50 Hz - 1 min				
core/core	$V_{\text{eff}}$	2500	2500	2500
core/screen	$V_{\text{eff}}$	2500	2500	2500

<sup>1)</sup>  $\leq 105$  nF/km for single core in center

<sup>2)</sup>  $\leq 155$  nF/km for single core in center

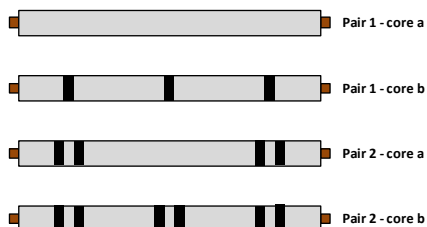
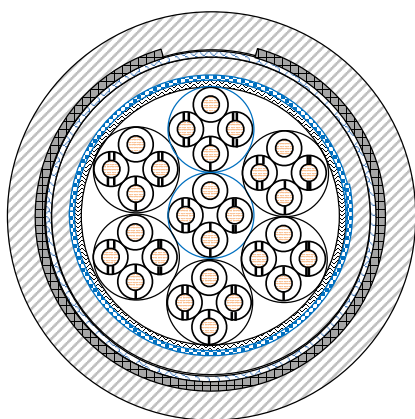
## A-2YOF(L)2YB2Y

No. of cores	n x 1 x 0.9 mm (H115)			n x 1 x 1.4 mm (H145)			n x 1 x 1.8 mm (H145)		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
2	13.0	160	1000	-	-	-	-	-	-
4	13.0	170	1000	14.0	240	1000	16.0	300	1000
7	14.0	220	1000	17.0	320	1000	19.0	430	1000
10	17.0	290	1000	18.0	410	1000	21.0	560	1000
14	17.0	300	1000	19.0	490	1000	22.0	680	1000
20	18.0	380	1000	22.0	630	1000	25.0	890	1000
24	20.0	460	1000	23.0	730	1000	27.0	1060	1000
30	20.0	490	1000	24.0	840	1000	29.0	1230	1000
40	21.0	590	1000	27.0	1050	1000	32.0	1560	1000
50	23.0	700	1000	29.0	1280	1000	36.0	1940	1000
60	25.0	800	1000	32.0	1490	1000	38.0	2280	1000
80	26.0	1000	1000	35.0	1920	1000	42.0	2920	1000
100	27.5	1250	1000	39.0	2350	1000	47.0	3630	500
120	32.0	1390	1000	41.0	2730	1000	49.0	4230	500
140	35.0	1650	1000	44.0	3140	1000	53.0	4890	500
160	36.0	1790	1000	46.0	3540	500	55.0	5490	500
180	39.0	2030	1000	49.0	3970	500	59.0	6160	500
200	39.0	2150	1000	50.0	4310	500	60.0	6710	500

# Signalling Cable

## A-2Y(L)2YB2Y (H45)

n x 4 x 0.9 mm / 1.4 mm



### APPLICATION

In railway signalling applications for transmission of low frequent signal through symmetric circuits, for example axle counter devices and similar wayside equipment.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm or 1.4 mm of diameter

#### Insulation

PE, natural coloured with ring marking, each first quad in layer carry a blue helix, all other quads carry white helix

#### Twisting

Cores twisted to star quads, quads laid up in layers

#### Moisture barrier sheath

Laminated sheath made of aluminium tape 0.15 mm, one side copolymer coated, bonded with

#### Inner sheath

PE, black

#### Armouring

One layer of galvanized steel tape 0.2 mm, helically applied

#### Outer sheath

PE, black



-10°C; + 60°C  
-40°C; + 60°C

≥ 10 x D  
≥ 7,5 x D

EN/IEC  
61034

### Notes

- Optional without armouring as A-2Y(L)2YV and with protection against inductive interference as AJ-2Y(L)2YDB2Y.
- Detailed data sheet available upon request.

- > Signalling cable acc. to PH 416.0115 V1.1 of Deutsche Bahn
- > Star quad stranded, steel tape armoured

Characteristics	unit	0.9 mm	1.4 mm
Conductor loop resistance	$\Omega/\text{km}$	$\leq 56.6$	$\leq 23.4$
Insulation resistance	$\text{G}\Omega \times \text{km}$	$\geq 10$	$\geq 10$
Mutual capacitance at 800 Hz	$\text{nF}/\text{km}$	$\leq 45$ <sup>1)</sup>	$\leq 45$ <sup>1)</sup>
Capacitance unbalance at 800 Hz			
$k_1$ (100 % / 50 % of all values)	$\text{pF}/500 \text{ m}$	$\leq 650 / \leq 150$	$\leq 650 / -$
$k_{9-12}$ neighboured quads	$\text{pF}/500 \text{ m}$	$\leq 500 / \leq 150$	$\leq 500 / -$
$k_{9-12}$ over-neighboured quads	$\text{pF}/500 \text{ m}$	$\leq 150$	$\leq 150$
$e_{a1/2}$	$\text{pF}/500 \text{ m}$	$\leq 1300$	$\leq 1300$
Far-end crosstalk attenuation at 90 kHz			
100 % / 80 % of all values	$\text{dB}/\text{km}$	$\geq 58 / \geq 62$	$\geq 33 / -$
Attenuation at 90 kHz	$\text{dB}/\text{km}$	$\leq 3.3$	$\leq 2.6$
Test voltage at 50 Hz - 1 min			
core/core	$V_{\text{eff}}$	2500	2500
core/screen	$V_{\text{eff}}$	2500	2500

<sup>1)</sup>  $\leq 52 \text{ nF}/\text{km}$  for  $1 \times 4 \times \emptyset$  and for central quads, where 1st layer consist only of one quad, as well as in the outer layer of armoured cables.

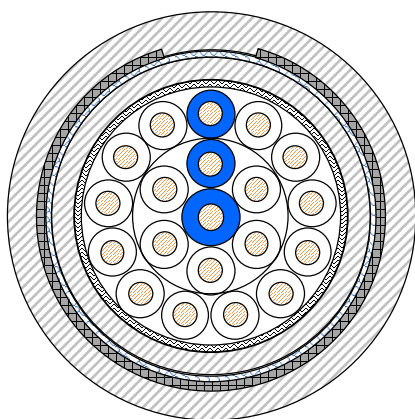
## A-2Y(L)2YB2Y

No. of quads	n x 4 x 0.9 mm (H45)			n x 4 x 1.4 mm (H45)		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
1	12.0	190	1000	14.0	260	1000
3	17.0	330	1000	21.0	570	1000
5	19.0	470	1000	24.0	820	1000
7	21.0	580	1000	26.0	1020	1000
10	24.0	750	1000	33.0	1190	1000
14	27.0	940	1000	36.0	1550	1000
20	30.0	1030	1000	42.0	2070	1000
30	36.0	1430	1000	49.0	2900	1000
40	40.0	1810	1000	55.0	3730	500

# Signalling Cable for Tunnels

## A-HHBH (H115/H145)

n x 1 x 0.9 mm / 1.4 mm / 1.8 mm



### APPLICATION

For railway signalling applications, wiring of light signals, point machines and similar wayside equipment, up to 420 V AC / 600 V DC. For use in areas with risk of fire, indoor or in tunnel sections.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm or 1.4 mm or 1.8 mm of diameter

#### Insulation

LSZH PE, natural coloured, with one blue marker core in each layer

#### Twisting

Cores laid up in layers

#### Inner sheath

LSZH-FR PE, black

#### Armouring

One layer of galvanized steel tape 0.2 mm, helically applied

#### Outer sheath

LSZH-FR PE, black



-10°C; + 60°C  
-40°C; + 60°C



$\geq 10 \times D$   
 $\geq 7.5 \times D$



EN/IEC  
61034



EN/IEC  
60754-1



EN/IEC  
60332-3

### Notes

- Optional without armouring as A-HHV.
- Detailed data sheet available upon request.

- > Signalling cable based on PH 416.0113 V1.1 of Deutsche Bahn
- > Core stranded, steel tape armoured
- > Low smoke, halogen free and flame retardant design

Characteristics	unit	0.9 mm	1.4 mm	1.8 mm
Conductor resistance	$\Omega/\text{km}$	$\leq 28.9$	$\leq 11.9$	$\leq 7.2$
Insulation resistance	$\text{G}\Omega \times \text{km}$	$\geq 1.5$	$\geq 1.5$	$\geq 1.5$
Mutual capacitance at 800 Hz	$\text{nF}/\text{km}$	$\leq 115$ <sup>1)</sup>	$\leq 145$ <sup>2)</sup>	$\leq 145$ <sup>2)</sup>
Operating voltage DC/AC	V	$\leq 600 / \leq 420$	$\leq 600 / \leq 420$	$\leq 600 / \leq 420$
Test voltage at 50 Hz - 1 min				
core/core	$V_{\text{eff}}$	2500	2500	2500
core/screen	$V_{\text{eff}}$	2500	2500	2500

<sup>1)</sup>  $\leq 105$  nF/km for single core in center

<sup>2)</sup>  $\leq 155$  nF/km for single core in center

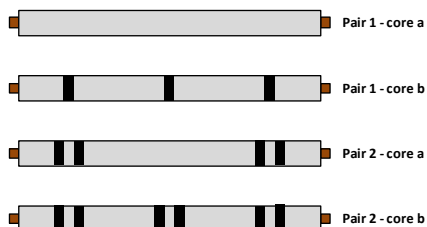
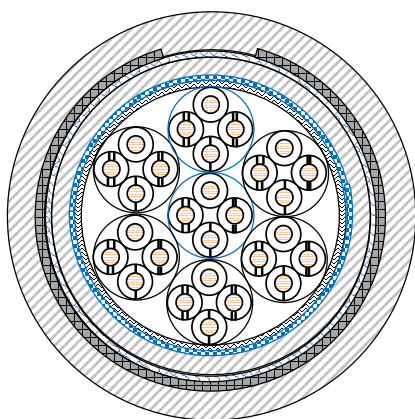
## A-HHBH

No. of cores	n x 1 x 0.9 mm (H115)			n x 1 x 1.4 mm (H145)			n x 1 x 1.8 mm (H145)		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
2	12.0	190	1000	-	-	-	-	-	-
4	12.5	209	1000	14.0	280	1000	15.5	330	1000
7	13.5	254	1000	15.5	358	1000	17.0	440	1000
10	15.0	315	1000	17.5	457	1000	20.0	580	1000
14	15.5	355	1000	18.5	547	1000	21.0	710	1000
20	16.5	421	1000	20.0	682	1000	24.0	925	1000
24	18.5	489	1000	22.0	785	1000	26.0	1060	1000
30	19.0	537	1000	23.0	901	1000	27.0	1240	1000
40	20.0	631	1000	24.5	1098	1000	30.0	1560	1000
50	22.0	746	1000	27.5	1319	1000	-	-	-
60	23.0	840	1000	29.0	1506	1000	-	-	-
80	25.0	1023	1000	-	-	-	-	-	-
100	28.0	1228	1000	36.0	2324	1000	-	-	-
120	29.0	1389	1000	-	-	-	-	-	-
140	31.0	1575	1000	40.5	3062	1000	-	-	-

# Signalling Cable for Tunnels

## A-H(L)HBH (H45)

n x 4 x 0.9 mm / 1.4 mm



### APPLICATION

In railway signalling applications for transmission of low frequent signal through symmetric circuits, for example axle counter devices and similar wayside equipment. For use in areas with risk of fire, indoor or in tunnel sections.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm or 1.4 mm of diameter

#### Insulation

LSZH PE, natural coloured with ring marking, each first quad in layer carry a blue helix, all other quads carry white helix

#### Twisting

Cores twisted to star quads, quads laid up in layers

#### Moisture barrier sheath

Laminated sheath made of aluminium tape 0.15 mm, one side copolymer coated, bonded with

#### Inner sheath

LSZH-FR PE, black

#### Armouring

One layer of galvanized steel tape 0.2 mm, helically applied

#### Outer sheath

LSZH-FR PE, black



-10°C; + 60°C  
-40°C; + 60°C



≥ 10 x D  
≥ 7.5 x D



EN/IEC  
61034



EN/IEC  
60754-1



EN/IEC  
60332-3

### Notes

- Optional without armouring as A-H(L)HV.
- Detailed data sheet available upon request.

- > Signalling cable based on PH 416.0115 V1.1 of Deutsche Bahn
- > Star quad stranded, steel tape armoured
- > Low smoke, halogen free and flame retardant design

Characteristics	unit	0.9 mm	1.4 mm
Conductor loop resistance	$\Omega/\text{km}$	$\leq 56.6$	$\leq 23.4$
Insulation resistance	$\text{G}\Omega\text{xkm}$	$\geq 10$	$\geq 10$
Mutual capacitance at 800 Hz	$\text{nF}/\text{km}$	$\leq 45$ <sup>1)</sup>	$\leq 45$ <sup>1)</sup>
Capacitance unbalance at 800 Hz			
$k_1$ (100 % / 50 % of all values)	$\text{pF}/500 \text{ m}$	$\leq 650 / \leq 150$	$\leq 650 / -$
$k_{9-12}$ neighboured quads	$\text{pF}/500 \text{ m}$	$\leq 500 / \leq 150$	$\leq 500 / -$
$k_{9-12}$ over-neighboured quads	$\text{pF}/500 \text{ m}$	$\leq 150$	$\leq 150$
$e_{a1/2}$	$\text{pF}/500 \text{ m}$	$\leq 1300$	$\leq 1300$
Far-end crosstalk attenuation at 90 kHz			
100 % / 80 % of all values	$\text{dB}/\text{km}$	$\geq 58 / \geq 62$	$\geq 33 / -$
Attenuation at 90 kHz	$\text{dB}/\text{km}$	$\leq 3.3$	$\leq 2.6$
Test voltage at 50 Hz - 1 min			
core/core	$V_{\text{eff}}$	2500	2500
core/screen	$V_{\text{eff}}$	2500	2500

<sup>1)</sup>  $\leq 52 \text{ nF}/\text{km}$  for  $1 \times 4 \times \emptyset$  and for central quads, where 1st layer consist only of one quad, as well as in the outer layer of armoured cables.

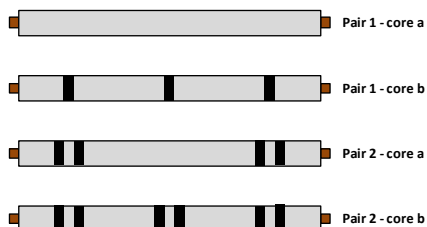
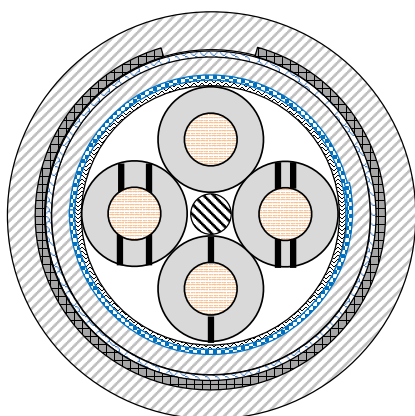
## A-H(L)HBH

No. of quads	$n \times 4 \times 0.9 \text{ mm (H45)}$			$n \times 4 \times 1.4 \text{ mm (H45)}$		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
1	13.5	260	1000	15.5	350	1000
3	18.0	450	1000	22.5	680	1000
5	20.5	580	1000	26.0	930	1000
7	22.0	680	1000	28.5	1130	1000
10	25.5	860	1000	33.5	1480	1000
14	28.0	1050	1000	37.5	1860	1000
20	-	-	-	42.5	2440	1000

# Signalling Cable

## A-2Y(L)2YB2Y Balise Cable

n x 4 x 1.4 mm / 1.53 mm



### APPLICATION

For railway safety equipment, used for train detection according to ETCS (European Train Control System) technology. Max. installation distance up to 2000 m.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 1.4 mm or 1.53 mm of diameter

#### Insulation

PE, natural coloured with ring marking,

#### Twisting

Cores twisted to star quad

#### Moisture barrier sheath

Laminated sheath made of aluminium tape 0.15 mm, one side copolymer coated, bonded with

#### Inner sheath

PE, black

#### Armouring

One layer of galvanized steel tape 0.2 mm, helically applied

#### Outer sheath

PE, black



-10°C; + 60°C  
-40°C; + 60°C

$\geq 10 \times D$   
 $\geq 7.5 \times D$

EN/IEC  
61034

### Notes

- Optional with protection against inductive interference as AJ-2Y(L)2YDB2Y.
- Detailed data sheet available upon request.



- > Balise cable acc. to PH 416.0120 V0.4 of Deutsche Bahn
- > Star quad stranded, steel tape armoured

Characteristics	unit	1.4 mm	1.53 mm
Max. installation distance	m	500	2000
Conductor cross-section	mm <sup>2</sup>	1.5	1.8
Conductor loop resistance	Ω/km	≤ 23.4	≤ 19.8
Insulation resistance	GΩxkm	≥ 10	≥ 10
Mutual capacitance at 800 - 1000 Hz	nF/km	≤ 52	≤ 43
Capacitance unbalance at 800 -1000 Hz			
k <sub>1</sub>	pF/500 m	≤ 650	≤ 240
e <sub>1/2</sub>	pF/500 m	≤ 1300	≤ 650
Impedance at			
8.8 kHz	Ω	147 ± 15 %	147 ± 15 %
200 - 600 kHz	Ω	120 ± 10 %	120 ± 10 %
1800 kHz	Ω	-	120 ± 10 %
Attenuation at			
8.8 kHz	dB/km	≤ 2	≤ 0.8
280 kHz	dB/km	≤ 5	≤ 3 <sup>1)</sup>
560 kHz	dB/km	≤ 7	≤ 4.2
1800 kHz	dB/km	-	≤ 8
Near-end crosstalk attenuation at 1 MHz	dB	≥ 55	≥ 60
Test voltage at 50 Hz - 1 min			
core/core	V <sub>eff</sub>	2500	2500
core/screen	V <sub>eff</sub>	2500	2500

<sup>1)</sup> The attenuation at 280 kHz must not be more than 1.8 dB/km smaller than the attenuation at 560 kHz.

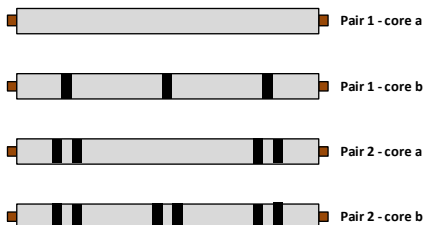
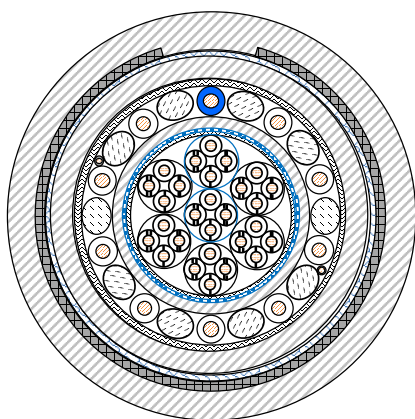
## A-2Y(L)2YB2Y Balise Cable

No. of quads	n x 4 x 1.4 mm			n x 4 x 1.53 mm		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
1	14.0	260	2000	18	350	2000

# Signalling Cable

## A-2Y(L)2Y2YB2Y Combi Cable

n x 4 x 0.9 / 1.4 mm + m x 1 x 0.9 / 1.4 / 1.8 mm



### APPLICATION

For railway signalling applications for transmission of low frequent signal through symmetric circuits, for example axle counter devices and similar wayside equipment with simultan power supply to the line side units.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm, 1.4 mm or 1.8 mm of diameter

#### Insulation

Data cores: PE, natural coloured with ring marking, each first quad in layer carry a blue helix, all other quads carry white helix.

Power cores: PE, natural coloured, with one blue marker core in each layer

#### Twisting

Cores twisted to star quads, quads laid up in layers.

#### Moisture barrier sheath

Laminated sheath made of aluminium tape 0.15 mm, one side copolymer coated, bonded with inner sheath PE, black

#### Stranding

Power cores laid up in layers

#### Intermediate sheath

PE, black

#### Armouring

One layer of galvanized steel tape 0.2 mm, helically applied

#### Outer sheath

PE, black



-10°C; + 60°C  
-40°C; + 60°C

≥ 10 x D  
≥ 7.5 x D

EN/IEC  
61034

### Notes

- Optional with protection against inductive interference as AJ-2Y(L)2YDB2Y and without armouring as A-2Y(L)2Y2YV.
- Detailed data sheet available upon request.

- > Combi cable acc. to PH 416.0118 of Deutsche Bahn
- > Star quad + single core stranded, steel tape armoured
- > Optional with protection against inductive interference

Characteristics	unit	Data quads		Power cores		
		0.9 mm	1.4 mm	0.9 mm	1.4 mm	1.8 mm
Conductor loop resistance	Ω/km	≤ 56.6	≤ 23.4	-	-	-
Conductor resistance	Ω/km	-	-	≤ 28.9	≤ 11.9	≤ 7.2
Insulation resistance	GΩxkm	≥ 10	≥ 10	≥ 10	≥ 10	≥ 10
Mutual capacitance at 800 Hz	nF/km	≤ 45 <sup>1)</sup>	≤ 45 <sup>1)</sup>	≤ 120	≤ 120	≤ 120
Capacitance unbalance at 800 Hz				-	-	-
k <sub>1</sub>	pF/500 m	≤ 650	≤ 650	-	-	-
k <sub>9-12</sub> adjacent quads	pF/500 m	≤ 500	≤ 500	-	-	-
k <sub>9-12</sub> over-adjacent quads	pF/500 m	≤ 150	≤ 150	-	-	-
e <sub>a1/2</sub>	pF/500 m	≤ 1300	≤ 1300	-	-	-
Near-end crosstalk attenuation at 40 kHz				-	-	-
in quad, average value	dB	≥ 65	≥ 65	-	-	-
minimum single value	dB	≥ 60	≥ 60	-	-	-
adjacent quad, average value	dB	≥ 65	≥ 65	-	-	-
minimum single value	dB	≥ 60	≥ 60	-	-	-
over-adjacent quad, average value	dB	≥ 70	≥ 70	-	-	-
minimum single value	dB	≥ 60	≥ 60	-	-	-
quad in adjacent lay, average value	dB	≥ 75	≥ 75	-	-	-
minimum single value	dB	≥ 65	≥ 65	-	-	-
Characteristic impedance at 40 kHz	Ω	130 ± 12 %	130 ± 12 %	-	-	-
Attenuation at 40 kHz	dB/km	≤ 2.6	≤ 1.5	-	-	-
Test voltage at 50 Hz - 1 min						
core/core	V <sub>eff</sub>	2500	2500	2500	2500	2500
core/screen	V <sub>eff</sub>	2500	2500	2500	2500	2500

<sup>1)</sup> ≤ 52 nF/km for 1 x 4 x Ø and for central quads, where 1st layer consist only of one quad, as well as in the outer layer of armoured cables.

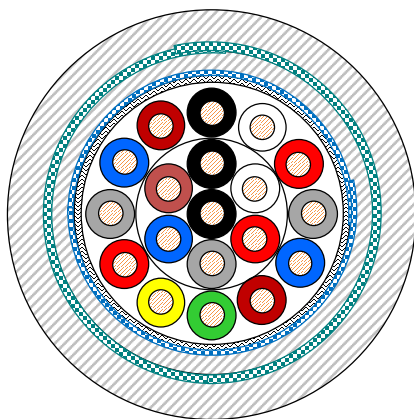
## A-2Y(L)2Y2YB2Y und AJ-2Y(L)2YDB2Y Combi Cable

Dimension	n x 4 x 1.4 mm		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
A-2Y(L)2Y2YV 1 x 4 x 0.9 + 4 x 1 x 1.4 S	19.0	350	1000
A-2Y(L)2YB2Y 1 x 4 x 0.9 + 4 x 1 x 1.4 S	23.0	520	1000
A-2Y(L)2YDB2Y 1 x 4 x 0.9 + 4 x 1 x 1.4 S rk600	27.0	1100	1000
A-2Y(L)2YDB2Y 1 x 4 x 0.9 + 4 x 1 x 1.4 S rk500	27.0	1150	1000
A-2Y(L)2YDB2Y 1 x 4 x 0.9 + 4 x 1 x 1.4 S rk400	29.0	1870	1000
A-2Y(L)2Y2YV 7 x 4 x 1.4 + 10 x 1 x 1.8 S	35.5	1360	1000
A-2Y(L)2YB2Y 7 x 4 x 1.4 + 10 x 1 x 1.8 S	39.0	1670	1000
A-2Y(L)2YDB2Y 7 x 4 x 1.4 + 10 x 1 x 1.8 S rk600	39.0	2400	1000
A-2Y(L)2YDB2Y 7 x 4 x 1.4 + 10 x 1 x 1.8 S rk500	40.0	2660	1000
A-2Y(L)2YDB2Y 7 x 4 x 1.4 + 10 x 1 x 1.8 S rk400	42.0	3820	1000

# Signalling Cable

## EAPSP

n x 1 x 0.9 mm / 1.4 mm



### APPLICATION

For railway signalling applications, wiring of light signals, point machines and similar wayside equipment.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm or 1.4 mm of diameter

#### Insulation

PE, color code by layer: starter core black, direction core white, all other cores red, grey, blue, brown, green, yellow - repetitive

#### Twisting

Cores laid up in layers

#### Moisture barrier sheath

Laminated sheath made of aluminium tape 0.2 mm, one side copolymer coated, bonded with

#### Inner sheath

PE, black

#### Armouring

Coated, corrugated steel tape, longitudinally applied with overlap

#### Outer sheath

PE, black



-10°C; + 60°C  
-40°C; + 60°C



≥ 10 x D  
≥ 7.5 x D



low  
EN/IEC  
61034

### Notes

- Detailed data sheet available upon request.
- Optional in halogen free, flame retardant version as EATST.
- Also available in pair twisting or with individual shielded pairs.
- Optional available in a longitudinal water tight version EAPSP-R.

- > Signalling cable acc. to E.T. 03.365.051.6, 03/2005 of adif
- > Core stranded, steel tape armoured

Characteristics	unit	0.9mm	1.4 mm
Conductor resistance, mean value	$\Omega/\text{km}$	28.9	11.7
Resistance unbalance	%	2	2
Insulation resistance	$\text{G}\Omega \times \text{km}$	$\geq 25$	$\geq 25$
Dielectric strength at 50 Hz, 1 min			
core/core	$V_{\text{eff}}$	2100	2100
core/screen	$V_{\text{eff}}$	2500	2500
core/armouring	$V_{\text{eff}}$	2000	2000

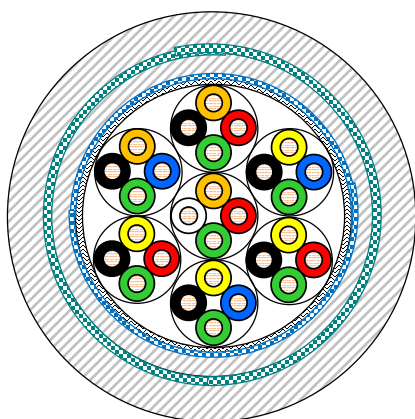
## EAPSP

No. of cores	n x 1 x 0.9 mm			n x 1 x 1.4 mm		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
4	-	-	-	16.0	270	1000
7	-	-	-	17.5	350	1000
9	-	-	-	20.0	420	1000
12	17.0	290	1000	20.5	440	1000
19	19.0	365	1000	22.0	560	1000
27	21.0	460	1000	24.5	740	1000
37	23.0	565	1000	26.5	930	1000
48	25.0	685	1000	29.5	1160	1000
61	-	-	-	32.0	1490	1000

# Signalling Cable

## EAPSP

n x 4 x 0.9 mm / 1.4 mm



### APPLICATION

For railway signalling applications, for example axle counter, level crossing gates and similar wayside equipment.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm or 1.4 mm of diameter

#### Insulation

PE, color code see specification adif

#### Twisting

Cores twisted to star quads, star quads laid up in layers

#### Moisture barrier sheath

Laminated sheath made of aluminium tape 0.2 mm, one side copolymer coated, bonded with

#### Inner sheath

PE, black

#### Armouring

Coated, corrugated steel tape, longitudinally applied with overlap

#### Outer sheath

PE, black



-10°C; + 60°C  
-40°C; + 60°C



$\geq 10 \times D$   
 $\geq 7.5 \times D$



low  
EN/IEC  
61034

### Notes

- Detailed data sheet available upon request.
- Optional in halogen free, flame retardant version as EATST.
- Also available in pair twisting or with individual shielded pairs.
- Optional available in a longitudinal water tight version as EAPSP-R.

- > Signalling cable acc. to E.T. 03.365.051.6, 03/2005 of adif
- > Star quad stranded, steel tape armoured

Characteristics	unit	0.9mm	1.4 mm
Conductor resistance, mean value	$\Omega/\text{km}$	28.5	11.7
Resistance unbalance	%	1	1
Insulation resistance	$\text{G}\Omega \times \text{km}$	$\geq 25$	$\geq 25$
Mutual capacitance at 800 Hz	nF/km	$\leq 41$	$\leq 45$
Capacitance unbalance at 800 Hz			
$k_1$ mean/individual value	pF/460 m	$\leq 35 / 250$	$\leq 35 / 250$
$k_{9-12}$ mean/individual value	pF/460 m	$\leq 35 / 250$	$\leq 35 / 250$
$e_{at/2}$ mean/individual value	pF/460 m	$\leq 320 / 1200$	$\leq 320 / 1200$
Attenuation at 1 kHz	dB/km	$\leq 0.7$	$\leq 0.46$
Dielectric strength at 50 Hz, 1 min			
core/core	$V_{\text{eff}}$	2100	2100
core/screen	$V_{\text{eff}}$	2500	2500
core/armouring	$V_{\text{eff}}$	2000	2000

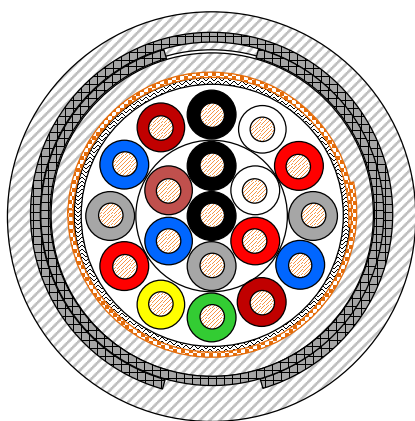
## EAPSP

No. of quads	n x 4 x 0.9 mm			n x 4 x 1.4 mm		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
1	15.0	205	1000	17.0	275	1000
3	19.0	315	1000	23.0	490	1000
5	21.5	430	1000	26.0	690	1000
7	23.0	500	1000	30.0	885	1000
10	27.5	750	1000	34.0	1185	1000
14	30.0	920	1000	38.0	16650	500
19	-	-	-	43.0	2120	500

# Signalling Cable

## CCPSSP-FR0.3

n x 1 x 0.9 mm / 1.4 mm



### APPLICATION

For railway signalling applications, wiring of light signals, point machines and similar wayside equipment.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm or 1.4 mm of diameter

#### Insulation

PE, color code see specification adif

#### Twisting

Cores laid up in layers

#### Screen

Corrugated copper tape with overlap, longitudinally applied

#### Inner sheath

PE, black

#### Armouring

Two layers of galvanized steel tape 0.5 or 0.8 mm, helically applied

#### Outer sheath

PE, black



-10°C; + 60°C  
-40°C; + 60°C



≥ 10 x D  
≥ 7.5 x D



EN/IEC  
61034

### Notes

- Detailed data sheet available upon request.
- Optional in core stranded version.
- Optional in halogen free, flame retardant version as CCTSST-FR0.3.



- > Signalling cable acc. to E.T. 03.365.051.6, 03/2005 of adif
- > Core stranded, steel tape armoured
- > With protection against inductive interference

Characteristics	unit	0.9mm	1.4 mm
Conductor resistance, mean value	$\Omega/\text{km}$	28.9	11.7
Resistance unbalance	%	2	2
Insulation resistance	$\text{G}\Omega \times \text{km}$	$\geq 35$	$\geq 35$
Dielectric strength at 50 Hz, 1 min			
core/core	$V_{\text{eff}}$	2100	2100
core/screen	$V_{\text{eff}}$	2500	2500
Reduction factor at 50 Hz, 110-320 V/km	$r_k$	$\leq 0.3$	$\leq 0.3$

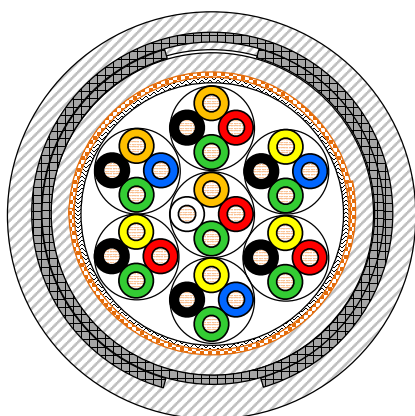
### CCPSSP-FR0.3

No. of cores	n x 1 x 0.9 mm			n x 1 x 1.4 mm		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
2	-	-	-	16.5	530	1000
4	-	-	-	17.5	610	1000
7	-	-	-	19.0	720	1000
9	-	-	-	22.7	915	1000
12	17.0	-	1000	23.2	977	1000
19	19.0	-	1000	25.2	1185	1000
27	21.0	-	1000	28.1	1440	1000
37	23.0	-	1000	31.4	1755	1000
48	25.5	-	1000	34.2	2065	1000

# Signalling Cable

## CCPSSP-FR0.3

n x 4 x 0.9 mm / 1.4 mm



### APPLICATION

For railway signalling applications, for example axle counter, level crossing gates and similar wayside equipment. Protected against inductive interferences, for example on AC electrified railroads.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm or 1.4 mm of diameter

#### Insulation

PE, color code see specification adif

#### Twisting

Cores twisted to star quads, star quads laid up in layers

#### Screen

Corrugated copper tape with overlap, longitudinally applied

#### Inner sheath

PE, black

#### Armouring

Two layers of galvanized steel tape 0.5 or 0.8 mm, helically applied

#### Outer sheath

PE, black



-10°C; + 60°C  
-40°C; + 60°C



≥ 10 x D  
≥ 7.5 x D



EN/IEC  
61034

### Notes

- Detailed data sheet available upon request.
- Optional in core stranded version.
- Optional in halogen free, flame retardant version as CCTSST-FR0.3.

- > Signalling cable acc. to E.T. 03.365.051.6, 03/2005 of adif
- > Star quad stranded, steel tape armoured
- > With protection against inductive interference

Characteristics	unit	0.9mm	1.4 mm
Conductor resistance, mean value	$\Omega/\text{km}$	28.5	11.7
Resistance unbalance	%	1	1
Insulation resistance	$\text{G}\Omega \times \text{km}$	$\geq 25$	$\geq 25$
Mutual capacitance at 800 Hz	$\text{nF}/\text{km}$	$\leq 41$	$\leq 45$
Capacitance unbalance at 800 Hz			
$k_1$ mean/individual value	$\text{pF}/460 \text{ m}$	$\leq 35 / 250$	$\leq 35 / 250$
$k_{9-12}$ mean/individual value	$\text{pF}/460 \text{ m}$	$\leq 35 / 250$	$\leq 35 / 250$
$e_{at/2}$ mean/individual value	$\text{pF}/460 \text{ m}$	$\leq 320 / 1200$	$\leq 320 / 1200$
Attenuation at 1 kHz	$\text{dB}/\text{km}$	$\leq 0.7$	$\leq 0.46$
at 10 kHz	$\text{dB}/\text{km}$	$\leq 1.6$	$\leq 0.85$
at 30 kHz	$\text{dB}/\text{km}$	$\leq 2.1$	$\leq 1.3$
Dielectric strength at 50 Hz, 1 min			
core/core	$V_{\text{eff}}$	2100	2100
core/screen	$V_{\text{eff}}$	2500	2500
Reduction factor at 50 Hz, 110-320 V/km	$r_k$	$\leq 0.3$	$\leq 0.3$

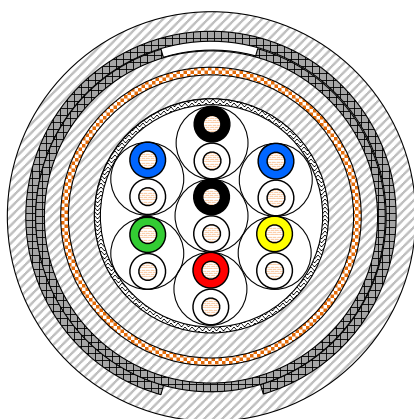
### CCPSSP-FR0.3

No. of quads	n x 4 x 0.9 mm			n x 4 x 1.4 mm		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
1	17.0	590	1000	19.0	740	1000
3	23.0		1000	27.0	1260	1000
5	24.5		1000	31.0	1620	1000
7	26.0	1110	1000	34.0	1850	1000
10	29.0	1390	1000	39.0	2330	1000
14			1000	43.0	2815	500
19			1000	47.0	3470	500
27			500	54.0	4460	500

# Signalling Cable

## ZPAU

$n \times 2 \times 1 \text{ mm}^2$



### APPLICATION

For railway signalling applications, for example point machines, light signals, axle counter, level crossing gates and similar wayside equipment. Protected against inductive interferences, for example on AC electrified railroads.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed,  $1 \text{ mm}^2$  of cross section

#### Insulation

PE, color code see specification SNCF

#### Twisting

Cores twisted to pairs, pairs laid up in layers

#### Inner sheath

PE, black

#### Screen

Corrugated copper foil, longitudinally applied

#### Intermediate sheath

PE, black

#### Armouring

Two layers of high permeability steel tape 0.2 mm to 0.5 mm, helically applied

#### Outer sheath

PVC, black



-5°C; +50°C  
-25°C; +60°C

$\geq 10 \times D$   
 $\geq 7.5 \times D$

EN/IEC  
60332-1

### Notes

- Detailed data sheet available upon request.

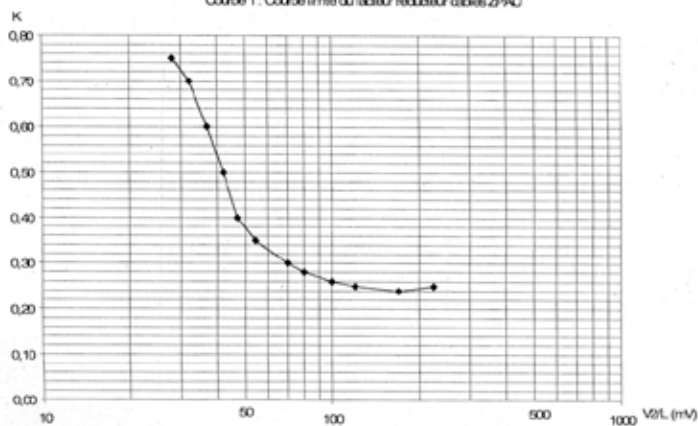
- > Signalling cable acc. to NF F 55-698 & CT445 of SNCF
- > Pair stranded, steel tape armoured
- > With protection against inductive interference

Characteristics	unit	1 mm <sup>2</sup>
Conductor resistance	Ω/km	≤ 18.1
Insulation resistance	GΩxkm	≥ 5
Mutual capacitance at 800 Hz	nF/km	≤ 55
Capacitance unbalance at 800 Hz	pF/500 m	≤ 200
Characteristic impedance		
at 20 - 45 kHz	Ω	120 ± 10
at 45 - 80 kHz	Ω	115 ± 10
Attenuation		
at 20 - 45 kHz	dB/km	≤ 2.5
at 45 - 80 kHz	dB/km	≤ 3
Operating voltage AC / DV	V <sub>eff</sub> / V	450/750
peak value AC	V <sub>eff</sub>	900
Dielectric strength at 50 Hz, 3 min		
core/core	V <sub>eff</sub>	3000
core/screen	V <sub>eff</sub>	3000
Reduction factor at 50 Hz, xxx-xxx V/km	r <sub>k</sub>	≤ 0.x

## ZPAU

No. of pairs	Outer diameter [mm]	n x 2 x 1 mm <sup>2</sup>	
		Cable weight [kg/km]	Standard length [m]
2	18.2	530	1000
4	23.8	665	1000
7	26.7	845	1000
14	31.0	1200	1000
21	35.5	1570	1000
28	39.5	1910	500
56	49.5	3100	500

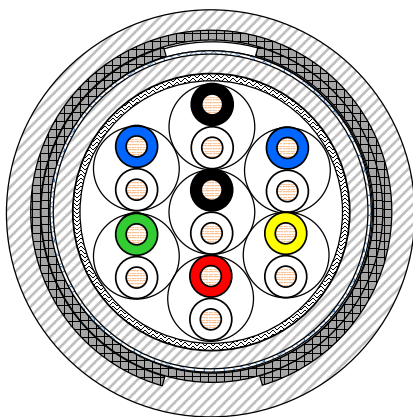
Courbe 1 : Courbe limite du facteur réducteur câbles ZPAU



# Signalling Cable

## ZPFU

$n \times 2 \times 1 \text{ mm}^2$



### APPLICATION

For railway signalling applications, for example point machines, light signals, axle counter, level crossing gates and similar wayside equipment.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed,  $1 \text{ mm}^2$  of cross section

#### Insulation

PE, color code see specification SNCF

#### Twisting

Cores twisted to pairs, pairs laid up in layers

#### Inner sheath

PE, black

#### Armouring

Two layers of galvanized steel tape 0.15 to 0.5 mm, helically applied

#### Outer sheath

PVC or PE, black



-5°C; +50°C  
-25°C; +60°C

$\geq 10 \times D$   
 $\geq 7.5 \times D$

EN/IEC  
60332-1

### Notes

- Detailed data sheet available upon request.

- > Signalling cable acc. to NF F 55-698 & CT445 of SNCF
- > Pair stranded, steel tape armoured

Characteristics	unit	1 mm <sup>2</sup>
Conductor resistance	Ω/km	≤ 18.1
Insulation resistance	GΩxkm	≥ 5
Mutual capacitance at 800 Hz	nF/km	≤ 55
Capacitance unbalance at 800 Hz	pF/500 m	≤ 200
Characteristic impedance		
at 20 - 45 kHz	Ω	120 ± 10
at 45 - 80 kHz	Ω	115 ± 10
Attenuation		
at 20 - 45 kHz	dB/km	≤ 2.5
at 45 - 80 kHz	dB/km	≤ 3
Operating voltage AC / DV	V <sub>eff</sub> / V	450/750
peak value AC	V <sub>eff</sub>	900
Dielectric strength at 50 Hz, 3 min		
core/core	V <sub>eff</sub>	3000
core/screen	V <sub>eff</sub>	3000

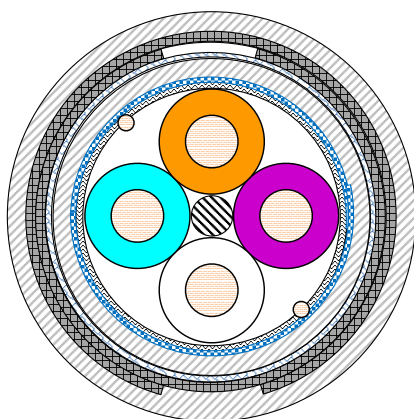
## ZPFU

No. of pairs	Outer diameter [mm]	n x 2 x 1 mm <sup>2</sup>	
		Cable weight [kg/km]	Standard length [m]
1	12.5	160	1000
2	13.7	235	1000
4	18.6	350	1000
7	22.4	670	1000
14	28.0	1000	1000
21	32.4	1360	1000
28	36.5	1660	500
56	47.8	2900	500

# Signalling Cable

## PE-ALT-CLT Balise Cable

1 x 4 x 1.53 mm



### APPLICATION

For railway safety equipment, used for train detection according to ETCS (European Train Control System) technology.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 1.53 mm of diameter

#### Insulation

PE, color code circuit 1: white/orange, circuit 2: turquoise/violet

#### Twisting

Cores twisted to one star quad

#### Moisture barrier sheath

Two tinned copper drain wires 0.8 mm, laminated sheath made of aluminium tape, one side copolymer coated, bonded with

#### Inner sheath

PE, black

#### Armouring

Two layers of galvanized steel tape 0.2 mm, helically applied

#### Outer sheath

PE, black



-5°C; +50°C  
-30°C; +70°C



$\geq 10 \times D$   
 $\geq 7.5 \times D$



EN/IEC  
61034

### Notes

- Detailed data sheet available upon request.
- Optional in halogen free, flame retardant version as PE-ALT-CLN



- > Balise cable acc. to I-AT-FS 3001.52.2000 of SBB
- > Star quad stranded, steel tape armoured

Characteristics	unit	1.53 mm
Conductor loop resistance	$\Omega/\text{km}$	$\leq 19.8$
Insulation resistance	$\text{k}\Omega \times \text{km}$	$\geq 10000$
Mutual capacitance at 800 - 1000 Hz	$\text{nF}/\text{km}$	$42.3 \pm 15 \%$
Capacitance unbalance at 800 - 1000 Hz		
$k_1$	$\text{pF}/\text{km}$	$\leq 240$
$e_a$	$\text{pF}/\text{km}$	$\leq 640$
Characteristic impedance at		
560/800 kHz	$\Omega$	$120 \pm 10 \%$
1800 kHz	$\Omega$	$120 \pm 5 \%$
Attenuation at		
8.82 kHz	$\text{dB}/100 \text{ m}$	$\leq 0.08$
560 kHz	$\text{dB}/100 \text{ m}$	$\leq 0.4$
800 kHz	$\text{dB}/100 \text{ m}$	$\leq 0.5$
1800 kHz	$\text{dB}/100 \text{ m}$	$\leq 0.8$
Dielectric strength at 50 Hz, 2 min		
core/core	$V_{\text{eff}}$	2500
core/screen	$V_{\text{eff}}$	2500

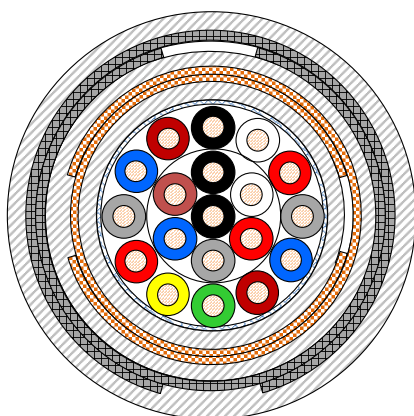
## PE-ALT-CLT Balise Cable

No. of quads	n x 4 x 1.53 mm		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
1	18.0	390	2000

# Signalling Cable

## AJ-2Y2Y(St)2YB2Y-FR0.3

n x 1 x 0.9 mm / 1.4 mm



### APPLICATION

For railway signalling applications, wiring of light signals, point machines and similar wayside equipment. Protected against inductive interferences, for example on AC electrified railroads.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm or 1.4 mm of diameter

#### Insulation

PE, color code by layer: starter core black, direction core white, all other cores red, grey, blue, brown, green, yellow - repetitive

#### Twisting

Cores laid up in layers

#### Inner sheath

PE, black

#### Screen

Two layers of copper tape, helically applied with overlap

#### Intermediate sheath

PE, black

#### Armouring

Two layers of galvanized steel tape 0.5 mm, helically applied

#### Outer sheath

PE, black



-10°C; +50°C  
-40°C; +70°C



$\geq 10 \times D$   
 $\geq 7.5 \times D$



low  
EN/IEC  
61034

### Notes

- Detailed data sheet available upon request.

- > Signalling cable acc. to specification of TCDD
- > Core stranded, steel tape armoured
- > With protection against inductive interference

Characteristics	unit	0.9mm	1.4 mm
Conductor resistance	$\Omega/\text{km}$	$\leq 28.8$	$\leq 11.9$
Insulation resistance	$\text{G}\Omega \times \text{km}$	$\geq 35$	$\geq 35$
Dielectric strength at 50 Hz, 5 min			
core/core	$V_{\text{eff}}$	3000	3000
core/armouring	$V_{\text{eff}}$	3000	3000
Reduction factor at 50 Hz, 100-350 V/km	$r_k$	$\leq 0.3$	$\leq 0.3$

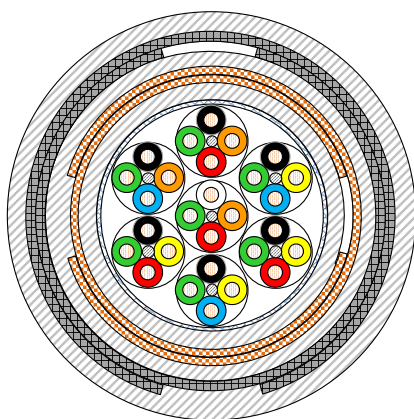
## AJ-2Y2Y(St)2YB2Y

No. of cores	n x 1 x 0.9 mm			n x 1 x 1.4 mm		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
4	20	610	1000	21	640	1000
7	-	-	-	22	770	1000
8	21	735	1000	-	-	-
9	-	-	-	25	935	1000
10	24	870	1000	-	-	-
12	-	-	-	26	1025	1000
19	-	-	-	29	1270	1000
20	26	1050	1000	-	-	-
27	-	-	-	32	1565	1000
30	30	1300	1000	-	-	-
37	-	-	-	35	1875	500
40	32	1490	1000	-	-	-
48	-	-	-	39	2245	500
60	37	1880	1000	-	-	-

# Signalling Cable

## AJ-2Y2Y(St)2YB2Y-FR0.3

n x 4 x 0.9 mm / 1.4 mm



### APPLICATION

For railway signalling applications, for example axle counter, level crossing gates and similar wayside equipment. Protected against inductive interferences, for example on AC electrified railroads.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm or 1.4 mm of diameter

#### Insulation

PE, color code see specification TCDD

#### Twisting

Cores twisted to star quads, star quads laid up in layers

#### Inner sheath

PE, black

#### Screen

Two layers of copper tape, helically applied with overlap

#### Intermediate sheath

PE, black

#### Armouring

Two layers of galvanized steel tape 0.5 mm, helically applied

#### Outer sheath

PE, black



-10°C; + 50°C  
-40°C; + 70°C

≥ 10 x D  
≥ 7.5 x D

low  
EN/IEC  
61034

### Notes

- Detailed data sheet available upon request.

- > Signalling cable acc. to specification of TCDD
- > Star quad stranded, steel tape armoured
- > With protection against inductive interference

Characteristics	unit	0.9mm	1.4 mm
Conductor resistance, mean value	$\Omega/\text{km}$	$\leq 28.8$	$\leq 11.9$
Insulation resistance	$\text{G}\Omega/\text{km}$	$\geq 35$	$\geq 35$
Mutual capacitance at 800 Hz (mean)	$\text{nF}/\text{km}$	$\leq 41$	$\leq 41$
Mutual capacitance at 800 Hz (max.)	$\text{nF}/\text{km}$	$\leq 48$	$\leq 48$
Capacitance unbalance at 800 Hz			
$k_1$ max. individual value	$\text{pF}/460 \text{ m}$	$\leq 250$	$\leq 250$
$k_{9-12}$ max. individual value	$\text{pF}/460 \text{ m}$	$\leq 250$	$\leq 250$
$e_{at/2}$ max. individual value	$\text{pF}/460 \text{ m}$	$\leq 1200$	$\leq 1200$
Attenuation at 1 kHz	$\text{dB}/\text{km}$	$\leq 0.7$	$\leq 0.46$
at 10 kHz	$\text{dB}/\text{km}$	$\leq 1.6$	$\leq 0.85$
Dielectric strength at 50 Hz, 5 min			
core/core	$V_{\text{eff}}$	3000	3000
core/armouring	$V_{\text{eff}}$	3000	3000
Reduction factor at 50 Hz, 100-350 V/km	$r_k$	$\leq 0.3$	$\leq 0.3$

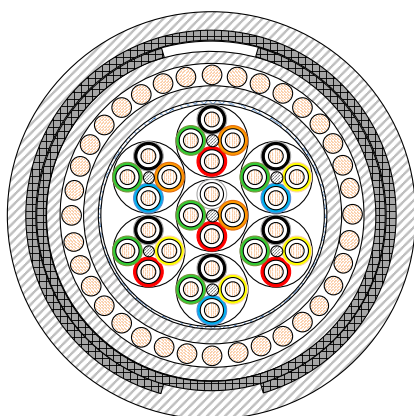
## AJ-2Y2Y(St)2YB2Y

No. of quads	n x 4 x 0.9 mm			n x 4 x 1.4 mm		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
1	-	-	-	20	650	1000
3	-	-	-	28	1150	500
5	-	-	-	32	1490	500
7	-	-	-	34	1730	500
9	-	-	-	40	2170	500
11	-	-	-	43	2410	500
12	-	-	-	43	2480	500

# Communication Cable

## AJ-02YS2YD2YB2Y-FR0.1

n x 4 x 0.9 mm



### APPLICATION

For railway communication applications. Protected against inductive interferences, for example on AC electrified railroads.

### CONSTRUCTION

#### Conductor

Bare, solid copper conductor, soft annealed, 0.9 mm or diameter

#### Insulation

PE, color code see specification TCDD

#### Twisting

Cores twisted to star quads, star quads laid up in layers

#### Inner sheath

PE, black

#### Screen

Concentrically positioned copper wires

#### Intermediate sheath

PE, black

#### Armouring

Two layers of galvanized steel tape 0.8 mm, helically applied

#### Outer sheath

PE, black



-10°C; + 50°C  
-40°C; + 70°C

≥ 10 x D  
≥ 7.5 x D

EN/IEC  
61034

### Notes

- Detailed data sheet available upon request.

- > Communication cable acc. to specification of TCDD
- > Star quad stranded, steel tape armoured
- > With protection against inductive interference

Characteristics	unit	0.9mm
Conductor resistance	$\Omega/\text{km}$	$27.5 \pm 1$
Resistance difference	%	$\leq 2$
Insulation resistance	$\text{G}\Omega \times \text{km}$	$\geq 35$
Mutual capacitance at 800 Hz (mean)	nF/km	$\leq 38$
Mutual capacitance at 800 Hz (max.)	nF/km	$\leq 45$
Capacitance unbalance at 800 Hz		
$k_1$ mean/max. individual value	pF/460 m	$\leq 35 / 250$
$k_{9-12}$ mean/max. individual value	pF/460 m	$\leq 35 / 250$
$e_{\text{st}/2}$ mean/max. individual value	pF/460 m	$\leq 320 / 1200$
Attenuation at 1 kHz	dB/km	$\leq 0.62$
at 10 kHz	dB/km	$\leq 1.5$
at 30 kHz	dB/km	$\leq 2.0$
NEXT at 30 kHz	dB	$\geq 65$
Dielectric strength at 50 Hz, 5 min		
core/core	$V_{\text{eff}}$	500
core/armouring	$V_{\text{eff}}$	2100
Reduction factor at 50 Hz		
11 V/km	$r_k$	$\leq 0.19$
20 V/km	$r_k$	$\leq 0.16$
50 V/km	$r_k$	$\leq 0.11$
110 V/km	$r_k$	$\leq 0.08$
200 V/km	$r_k$	$\leq 0.05$
300 V/km	$r_k$	$\leq 0.05$
500 V/km	$r_k$	$\leq 0.07$

## AJ-02YS2YD2YB2Y

No. of quads	n x 4 x 0.9 mm		
	Outer diameter [mm]	Cable weight [kg/km]	Standard length [m]
1	27.5	1520	500
2	31.5	1880	500
3	31.5	1900	500
5	38	2530	500
12	46	3420	500

# Designation codes for cables acc. to VDE

## 1. Cable Type

- A- Outdoor cable
- AJ- Outdoor cable with protection against inductive interference

## 2. Cable Design

- 2Y Polyethylene (PE) insulation material
- 02Y Cellular polyethylene (PE) insulation material
- 02YS Foam-skin polyethylene (PE) insulation material
- F Petroleum jelly filling compound
- OF Low capacitance filling compound
- TF Filling with water swellable yarns and fleeces
- (L)2Y Moisture barrier sheath (laminated AL-foil bonded to PE sheath)
- (St) Screen of copper tape
- D Screen of concentrically positioned copper wires
- Z Screen of concentrically positioned aluminium wires
- (SR) Armouring of corrugated steel tape, longitudinally applied
- B Armouring of helically applied steel tape
- Y Polyvinyl chloride (PVC) sheathing material
- 2Y Polyethylene sheathing material
- H Halogen free, flame retardant sheathing material
- V Reinforced sheathing



