Bayka since 1885

# Railway & Traffic cables




## Cable Catalogue

- **BayRail®** for signalling applications
- **BayCom®** for telecommunication applications
- **BayEnergy®** for grounding and power applications

# BAYERISCHE KABELWERKE AG

## CONTACT


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Tel: +49 (0)9171 806 111
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kabel@bayka.de


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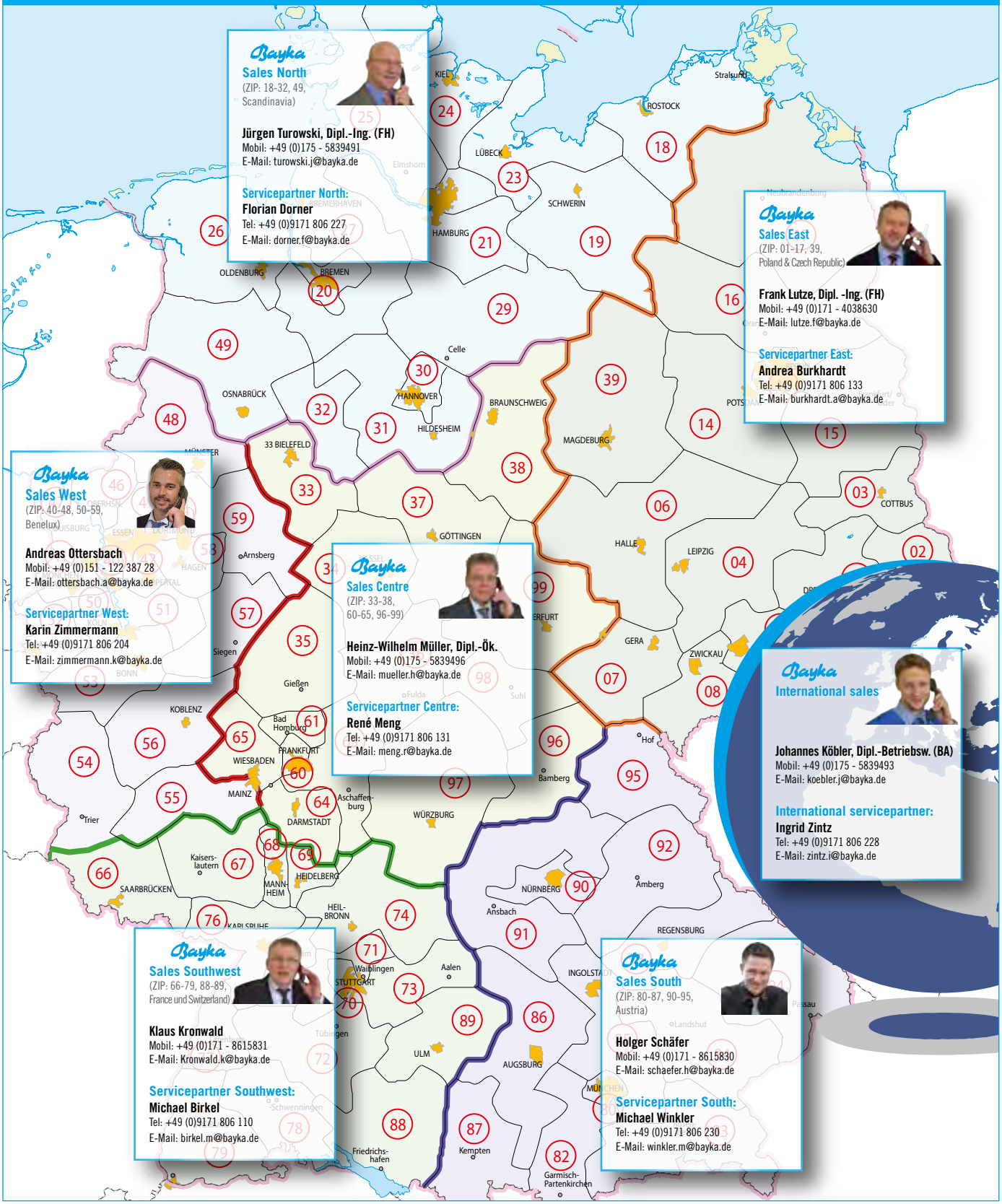


# DIRECTORY



## BayRail®

Signalling, Balise, PZB and LZB-cables

page 13 - 95



## BayCom®

Telecommunication-cables for Railways

page 96 - 112

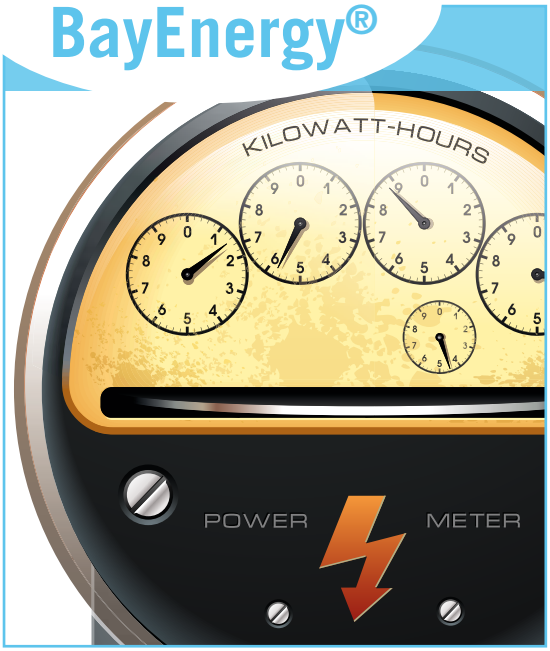


## BayEnergy®

Power and grounding cables for Railways


114 - 124 page

# BayEnergy®



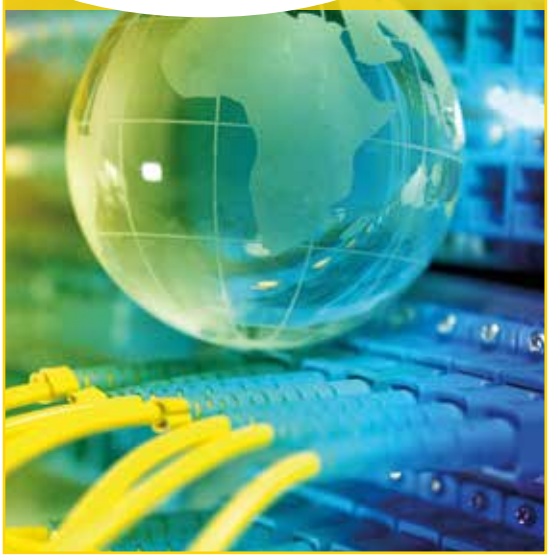

## Power cables

- Copper conductors, 1 kV to 30 kV
- Aluminium conductors, 1 kV to 30 kV
- Paper-insulated, 1 kV to 36 kV
- XLPE-insulated overhead lines, 1 kV
- Grounding cables, Cu-, Al-strands/ropes
- Cables according to international standards

### Standards

### References

# BayCom®



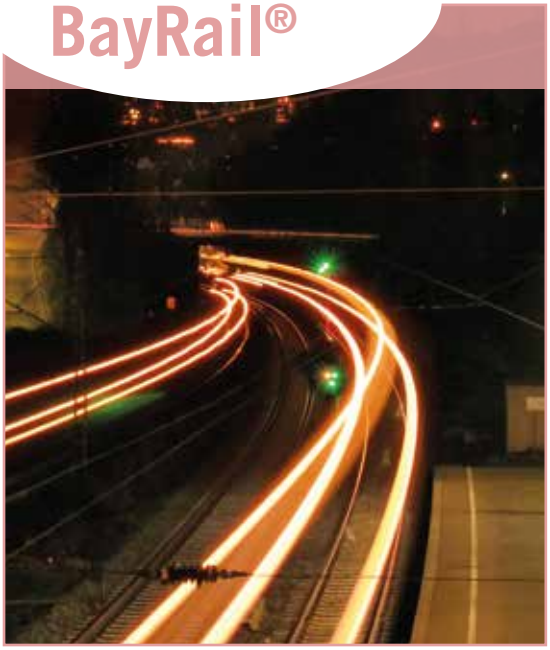
## Telecommunication cables

- BayCom®★ & BayCom®★★ Quality
- Multisystem- & wide area cables
- Inhouse- & Outdoor-HF-switchboard cables (xDSL)
- Local- & xDSL cables
- Fibre optic cables (FOC)
- Cables according to international standards

### Standards

### References

# BayRail®



## Cables for railways and transport

- Signalling cables
- Railfoot cables
- PZB, LZB- & Balise cables
- Railway power & grounding cables
- Telecommunication cables
- Cables according to international standards

### Standards

### References

# BayGreen®

## Cables for solar and wind power plants

- Copper solar cables
- Tower cables
- Power cables up to 30 kV
- Copper telecommunication cables
- Fibre optic telecommunication cables
- Inhouse, switchboard cables

Optional:

- UV-, ozone-, halogen free, EMC, FRNC, ...

### Standards

# BayMotion®

## Flexible connecting & interconnecting cables


- Flexible power & control cables
- Low-capacitance motor connecting cables
- Flexible power connecting cables

Optional:

- UV-, ozone-, oil resistant, EMC, FRNC, ...
- Cables according to international standards

### Standards

# BaySpecial®

## Special cables

- Hybrid cables (PowerComcable - PCc)
- Theft resistant cables
- RailOptic® - fibre optic railfoot cables
- Customized cables by request

We develop cables together with our customers! We are, for example, development partner of DB AG, Deutsche Telekom AG and Hamburger Hochbahn AG.
**We can find a customized solution for your problem. Please contact us!**

### Standards (acc. to customer requirements)

...

# BAYERISCHE KABELWERKE AG

The whole
## World of Cables
all from one source

*Ecology + know-how = sustainability!*

Bayerische Kabelwerke AG – Bayka – was founded in 1885 with its headquarter in Roth/Germany. "Satisfied customers have been the benchmark of our work for more than 125 years", this is the principle of our management.
We manufacture cables for power, telecommunication, railway and traffic networks, industrial applications, mechanical engineering and for green energy solutions.
Our comprehensive product range and our manufacturing processes are in accordance with national and international standards and specifications.

The cable portfolio varies from medium- and low-voltage, telecommunication and signalling cables, flexible control cables and (high screened) low-capacitance motor connection cables to wires and ropes.
Because of the high quality of our products and their reliability for decades Bayka has been a respected partner of power utilities, German Telecom (DT AG), German Railways (DB AG) and many other national and international customers.

**„Made in Germany"!**

Bayka seit 1885


**BAYERISCHE KABELWERKE AG**
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www.bayka.de



Chairman of the Supervisory Board: Christiane Wilms-Mester, Board of Directors: Johann Erich Wilms, Place of business: 91154 Roth · Germany, Filed under in the commercial register, HRB-Nr. 314 District Court of Nuremberg


# BAYKA COLOR FARBKONZENTRATE GMBH


Bayka Color Farbkonzentrate GmbH is a producer of colour concentrates, compounds, masterbatches and plastic mixtures and was initially established for its own use.

Caused by powerful equipment for plastics processing Bayka Color is now an independent company, which sells its high-quality products to international companies based in the plastics industry.

Bayka Color Farbkonzentrate GmbH


**BAYKA COLOR FARBKONZENTRATE GMBH**
Otto-Schrimpff-Strasse 2
91154 Roth · Germany

Tel: +49 (0)9171 806-144
Fax: +49 (0)9171 806-139
E-Mail: farbkonzentrate@bayka.de
www.baykacolor.de



Edition: 05/2016

# BAYKA BERLIN GMBH

Bayka Berlin GmbH is a specialized company for the production of power cables. Modern equipment, qualified staff and concentration of know how ensures productivity at its highest level.

We produce standard copper and aluminium cables as well as special cables according to customer requirements for national and international markets.

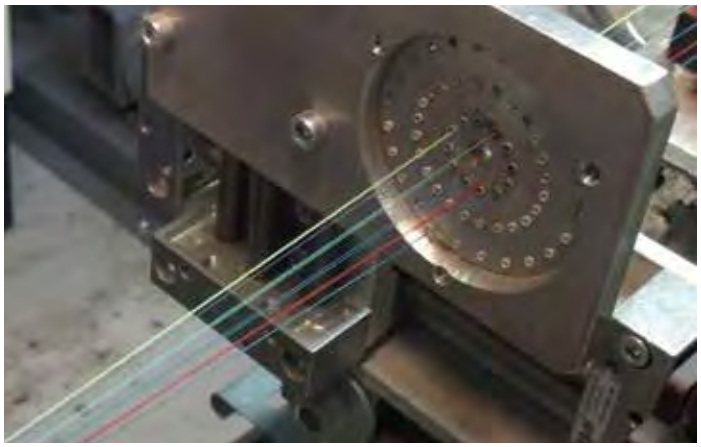
**BAYKA BERLIN GMBH**
Soltauer Strasse 8
13509 Berlin · Germany
www.bayka.de


# BGF- BERLINER GLASFASERKABEL GMBH

BGF (Berliner Glasfaserkabel GmbH) was established in 1986 and acquired by Bayka AG in 2005. Since this merger, we are able to offer a wider product range and complement our portfolio with the pioneering field of fibre optic cables.

Today, well-known companies such as Deutsche Telekom AG or DB AG trust in our outdoor, indoor, air and railfoot cables.

**BGF - BERLINER GLASFASERKABEL GMBH**
Wilhelminenhofstr. 76/77
12459 Berlin · Germany
www.bgf-kabel.de



Edition: 05/2016

# QUALITY & SUSTAINABILITY

The quality of our work and our products is the basic condition for our company's success, our ability to compete, and the protection of our employee's jobs.

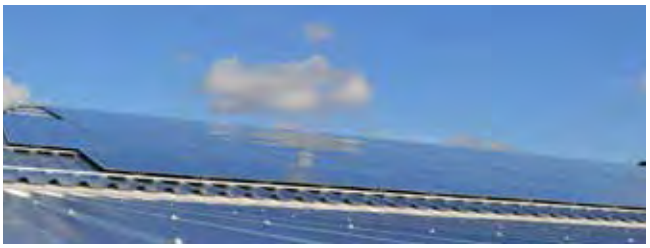
This is accomplished by the certifications per DIN EN ISO 9001 and KTA 1401 (quality), DIN EN ISO 14001, DIN EN ISO 50001 (environment) and OHSAS 18001, which are combined into an integrated management system and filled with life by Bayka employees.

Since July 2012 the photovoltaic plant has been installed on the company roofs. 12,100 m² achieve a total performance of 960 kWp.
At once we modernized our plant with new and energy-saving roofs and insulations.

**Bayka Photovoltaic plant**

**Total power:**
960 kWp

**Gross collector area:**
ca. 12.100 m²



# RESEARCH & DEVELOPMENT

As a development partner of national and international companies, we know the requirements our customers place on cables. The synergies from our energy, telecommunication, rail and signalling cable departments enable a purposeful and prompt development of cables.

Development updates of existing products or new developments per customer specification are implemented into an ideal cable design together with our customers, and are then produced by means of our flexible production equipment.

We continuously update this section. You will soon be provided with information about other developments, e.g.

- FOC rail-base cables
- Development updates for data cables
- Special use cables for railway installations
- Updates or new developments for special use cables
- Development of theft-protected rail grounding ropes
- Flexible TPU multi-function cables for transformer or sub-station building
- Together with you we can create a cable directly for your requirements.

Edition: 05/2016

# BAYKA REFERENCES

## Railway & Traffic

DB · ÖBB · adif · renfe · BOMBARDIER · axians · Balfour Beatty · HIGHWAYS AGENCY

## Telecommunication

Deutsche Telekom · vodafone · TELEKOM AUSTRIA GROUP · Telefónica · M-net · Thüringer Netkom

## Energy


e·on · RWE · essent · thüga · VATTENFALL

## Industry, Plants and mechanical engineering

SIEMENS · ABB · axians · DUENSING · voestalpine · Balfour Beatty · Ferrostaal

Edition: 05/2016

# BAYKA REFERENCES RAILWAY

Signalling cables, Telecommunication cables and fibre optic cables for railways

## Selection of German Highspeed-lines and other railway projects with Bayka support

### Hannover < -- > Würzburg
**Total Distance:** 327 km, **Build:** 1973-1991,
**Max. Speed (Vmax):** 280 km/h
**Bayka-cables:** Signalling, Telecommunication, TUSI® - Tunnelsafety and Fibre optical cables

### Cologne < -- > Rhein/Main
**Distance:** 180 km, **Build:** 1995-2002,
**Max. Speed (Vmax):** 300 km/h
**Bayka-cables:** Telecommunication, TUSI® - Tunnelsafety cables, LZB

### Nuremberg < -- > Munich
**Build:** 1999-2006, **Max. Speed (Vmax):** ca. 300 km/h
**Bayka-cables:** Signalling, Telecommunication, TUSI® - Tunnelsafety and Fibre optical cables

### Nuremberg < -- > Erfurt
**Distance:** 190 km, **Build:** 1996- ca. 2017
**Bayka-cables:** Signalling, Telecommunication, TUSI® - Tunnelsafety and Fibre optical cables

### Railway control centre 2010 - 2013:
Kitzingen-Rottendorf, Südwest (near Munich), Pasing (Munich), Osterhofen, Augsburg, Fürth

### Urban railway 2010 - 2013:
Nuremberg < -- > Neumarkt, Nuremberg < -- > Ansbach

### New tracks 2010 - 2013:
ABF Nord, ABF 38 near Munich

DB We are certified frame contract and development partner of the German Railways!

## Selection of international railway projects with Bayka support

### Australia:
Signalling cables

### Austria:
Signalling cables, Line conductor cables for the LZB system & grounding cables according to Austrian standards

### Bulgaria:
Signalling cables

### Denmark 2012:
Signalling cables

### Estonia 2012:
Signalling cables

### Finland:
Signalling cables

### France:
Signalling cables

### Italy 2012:
Fibre Optic, Rail-foot-cables

### Kroatia:
Signalling cables (old german spec.), PZB cables

### Sweden 2012 - 2013:
Grounding cables for railway

### Serbia:
Signalling cables, Fibre Optic cables, Power cables

### Slovakia 2013:
Signalling cables

### Slovenia 2011:
Signalling cables

### Switzerland:
Signalling cables, Balise cables acc. to Swiss Federal Railways standard

### Turkey, Turkmenistan:
Signalling cables

### United Kingdom:
Signalling cables

Edition: 05/2016

# BAYKA REFERENCES RAILWAY

Signalling cables, telecommunication cables and fibre optic cables for railways

## Selection of spanish railway projects with Bayka support

### Proyecto de Instalaciones de Seguridad y Comunicaciones Variante de Alpera
**Tipo de cable suministrado:** CCPSSP, CCPSSP-R, EAPSP, P y PI con F. R. 0,1 y 0,3
**Adjudicatario Proyecto:** BOMBARDIER TRANSPORTATION
**Cliente final:** ADIF

### Proyecto de Instalaciones de Seguridad y Comunicaciones Fuente Piedra-Antequera
**Tipo de cable suministrado:** CCPSSP, EAPSP, P y PI con F. R. 0,1 y 0,3
**Adjudicatario Proyecto:** BOMBARDIER TRANSPORTATION
**Cliente final:** ADIF

### Proyecto de Instalaciones de Seguridad y Comunicaciones Accesos Puerto Valencia
**Tipo de cable suministrado:** CCPSSP, CCPSSP-R, EAPSP, P y PI con F. R. 0,1 y 0,3
**Adjudicatario Proyecto:** BOMBARDIER TRANSPORTATION
**Cliente final:** ADIF

### Proyecto de Enclavamientos Eléctricos en Líneas 1 y 6 Metro Madrid
**Tipo de cable suministrado:** RFFW, EAPSP, CCTSST, P y PI
**Adjudicatario Proyecto:** BOMBARDIER TRANSPORTATION
**Cliente final:** Comunidad de Madrid – FC Metropolitano de Madrid

### Proyecto de Perturbaciones para affección de LAV en la Estación de Barcelona-Sants
**Tipo de cable suministrado:** EATST, CCTSST FR 0,3 P y PI, CCTSST-R FR 0,1
**Adjudicatario Proyecto:** BOMBARDIER TRANSPORTATION
**Cliente final:** ADIF

### Proyecto de Perturbaciones para affección de LAV en el tramo Lleida-Barcelona
**Tipo de cable suministrado:** CCPSSP, CCTSST FR 0,3
**Adjudicatario Proyecto:** BOMBARDIER TRANSPORTATION
**Cliente final:** ADIF

adif We are certified supplier of spanish railways for signalling and telecommunication cables

Edition: 05/2016

# A ROUND THING - BAYKA

Your requirements and our know-how are worked out in the dialog between operator (purchase & technology) and manufacturer for a round solution.

We look forward to your requirements and also find a suitable solution for you!


Edition: 05/2016

# SIGNALLING, BALISE, PZB AND LZB-CABLES



BayRail®

## Signalling cables



BayRail®

## Railfoot-, PZB-, LZB- and Balise cables



BayRail®

## Signalling cables according to international standards

# BayRail® - Signalling cables

## A-2YOF(L)2YB2Y - core-stranded, filled, (H115) / (H145)

...x1x0,9 acc. to DB TL 416.0113


similar to the illustration


## Standards

Technical specifications 416.0113,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance (pair of cores) Ω/km | ≤ 28,9 |
| Insulation resistance GΩxkm | ≥ 1,5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 115 |
| For the central core nF/km | ≤ 120 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| **Continuous operating voltage** | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

The cables are longitudinally watertight due to low capacitance filling material and transversally watertight due to a multi-layer sheath.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **OF** | filling of the cabled assembly with low capacitance filling material |
| **(L)2Y** | laminated sheath made of polyethylene |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H145)** | maximum mutual capacitance value at 800 Hz, 145 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2YOF(L)2YB2Y from 2x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2YOF(L)2YB2Y - core-stranded, filled, (H115) / (H145)

...x1x1,4 acc. to DB TL 416.0113


similar to the illustration


## Standards

Technical specifications 416.0113,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance (pair of cores) Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 1,5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 145 |
| For the central core nF/km | ≤ 155 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| **Continuous operating voltage** | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

The cables are longitudinally watertight due to low capacitance filling material and transversally watertight due to a multi-layer sheath.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **OF** | filling of the cabled assembly with low capacitance filling material |
| **(L)2Y** | laminated sheath made of polyethylene |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H145)** | maximum mutual capacitance value at 800 Hz, 145 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2YOF(L)2YB2Y from 4x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2YOF(L)2YB2Y - core-stranded, filled, (H115) / (H145)

...x1x1,8 acc. to DB TL 416.0113


similar to the illustration


## Standards

Technical specifications 416.0113,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance (pair of cores) Ω/km | ≤ 7,2 |
| Insulation resistance GΩxkm | ≥ 1,5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 145 |
| For the central core nF/km | ≤ 155 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| **Continuous operating voltage** | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

The cables are longitudinally watertight due to low capacitance filling material and transversally watertight due to a multi-layer sheath.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **OF** | filling of the cabled assembly with low capacitance filling material |
| **(L)2Y** | laminated sheath made of polyethylene |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H145)** | maximum mutual capacitance value at 800 Hz, 145 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2YOF(L)2YB2Y from 4x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2YOF(L)2YDB2Y - core-stranded, filled, (H115) / (H145)

...x1x0,9 acc. to DB TL 416.0113


similar to the illustration


## Standards

Technical specifications 416.0113,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance (pair of cores) Ω/km | ≤ 28,9 |
| Insulation resistance GΩxkm | ≥ 1,5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 115 |
| For the central core nF/km | ≤ 120 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| **Continuous operating voltage** | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

The cables are longitudinally watertight due to low capacitance filling material and transversally watertight due to a multi-layer sheath.

## Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **OF** | filling of the cabled assembly with low capacitance filling material |
| **(L)2Y** | laminated sheath made of polyethylene |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H115)** | maximum mutual capacitance value at 800 Hz, 115 nF/km |
| **rk** | reduction factor characteristic |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- AJ-2YOF(L)2YDB2Y from 10x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2YOF(L)2YDB2Y - core-stranded, filled, (H115) / (H145)

...x1x1,4 acc. to DB TL 416.0113


similar to the illustration


## Standards

Technical specifications 416.0113,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance (pair of cores) Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 1,5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 145 |
| For the central core nF/km | ≤ 155 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| **Continuous operating voltage** | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

The cables are longitudinally watertight due to low capacitance filling material and transversally watertight due to a multi-layer sheath.

## Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **OF** | filling of the cabled assembly with low capacitance filling material |
| **(L)2Y** | laminated sheath made of polyethylene |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H145)** | maximum mutual capacitance value at 800 Hz, 145 nF/km |
| **rk** | reduction factor characteristic |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- AJ-2YOF(L)2YDB2Y from 10x... to 200x...
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2YOF(L)2YDB2Y - core-stranded, filled, (H115) / (H145)

...x1x1,8 acc. to DB TL 416.0113


similar to the illustration


## Standards

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Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance (pair of cores) Ω/km | ≤ 7,2 |
| Insulation resistance GΩxkm | ≥ 1,5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 145 |
| For the central core nF/km | ≤ 155 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| **Continuous operating voltage** | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

The cables are longitudinally watertight due to low capacitance filling material and transversally watertight due to a multi-layer sheath.

## Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **OF** | filling of the cabled assembly with low capacitance filling material |
| **(L)2Y** | laminated sheath made of polyethylene |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H145)** | maximum mutual capacitance value at 800 Hz, 145 nF/km |
| **rk** | reduction factor characteristic |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- AJ-2YOF(L)2YDB2Y from 10x... to 160x...
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2YOF(L)2YB2Y - core-stranded, filled, (H95)

...x1x1,4 acc. to DB TL 416.0114


similar to the illustration


## Standards

Technical specifications 416.0114,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance (pair of cores) Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 1,5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 95 |
| For the central core nF/km | ≤ 105 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| **Continuous operating voltage** | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

The cables are longitudinally watertight due to low capacitance filling material and transversally watertight due to a multi-layer sheath.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **OF** | filling of the cabled assembly with low capacitance filling material |
| **(L)2Y** | laminated sheath made of polyethylene |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H95)** | maximum mutual capacitance value at 800 Hz, 95 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2YOF(L)2YB2Y from 10x... to 50x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2YOF(L)2YB2Y - core-stranded, filled, (H95)

...x1x1,8 acc. to DB TL 416.0114


similar to the illustration


## Standards

Technical specifications 416.0114,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance (pair of cores) Ω/km | ≤ 7,2 |
| Insulation resistance GΩxkm | ≥ 1,5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 95 |
| For the central core nF/km | ≤ 105 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| **Continuous operating voltage** | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

The cables are longitudinally watertight due to low capacitance filling material and transversally watertight due to a multi-layer sheath.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **OF** | filling of the cabled assembly with low capacitance filling material |
| **(L)2Y** | laminated sheath made of polyethylene |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H95)** | maximum mutual capacitance value at 800 Hz, 95 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2YOF(L)2YB2Y from 10x... to 50x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2YOF(L)2YDB2Y - core-stranded, filled, (H95)

...x1x1,4 acc. to DB TL 416.0114


similar to the illustration


## Standards

Technical specifications 416.0114,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance (pair of cores) Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 1,5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 95 |
| For the central core nF/km | ≤ 105 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Continuous operating voltage** | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

The cables are longitudinally watertight due to low capacitance filling material and transversally watertight due to a multi-layer sheath.

## Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **OF** | filling of the cabled assembly with low capacitance filling material |
| **(L)2Y** | laminated sheath made of polyethylene |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H95)** | maximum mutual capacitance value at 800 Hz, 95 nF/km |
| **rk** | reduction factor characteristic |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- AJ-2YOF(L)2YDB2Y from 10x... to 50x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2YOF(L)2YDB2Y - core-stranded, filled, (H95)

...x1x1,8 acc. to DB TL 416.0114


similar to the illustration


## Standards

Technical specifications 416.0114,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance (pair of cores) Ω/km | ≤ 7,2 |
| Insulation resistance GΩxkm | ≥ 1,5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 95 |
| For the central core nF/km | ≤ 105 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Continuous operating voltage** | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

The cables are longitudinally watertight due to low capacitance filling material and transversally watertight due to a multi-layer sheath.

## Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **OF** | filling of the cabled assembly with low capacitance filling material |
| **(L)2Y** | laminated sheath made of polyethylene |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H95)** | maximum mutual capacitance value at 800 Hz, 95 nF/km |
| **rk** | reduction factor characteristic |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- AJ-2YOF(L)2YDB2Y from 10x... to 50x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y(L)2YB2Y - quad stranded, (H45)

...x4x0,9 acc. to DB TL 416.0115


similar to the illustration


### Standards

Technical specifications 416.0115,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance (pair of cores) Ω/km | ≤ 56,6 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 |
| For the central quad nF/km | ≤ 50 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **(L)2Y** | laminated sheath made of polyethylene |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H45)** | maximum mutual capacitance value at 800 Hz, 45 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- A-2Y(L)2YB2Y from 1x... to 40x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y(L)2YB2Y - quad stranded, (H45)

...x4x1,4 acc. to DB TL 416.0115


similar to the illustration


## Standards

Technical specifications 416.0115,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance (pair of cores) Ω/km | ≤ 23,4 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 |
| For the central quad nF/km | ≤ 50 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **(L)2Y** | laminated sheath made of polyethylene |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H45)** | maximum mutual capacitance value at 800 Hz, 45 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2Y(L)2YB2Y from 1x... to 40x...

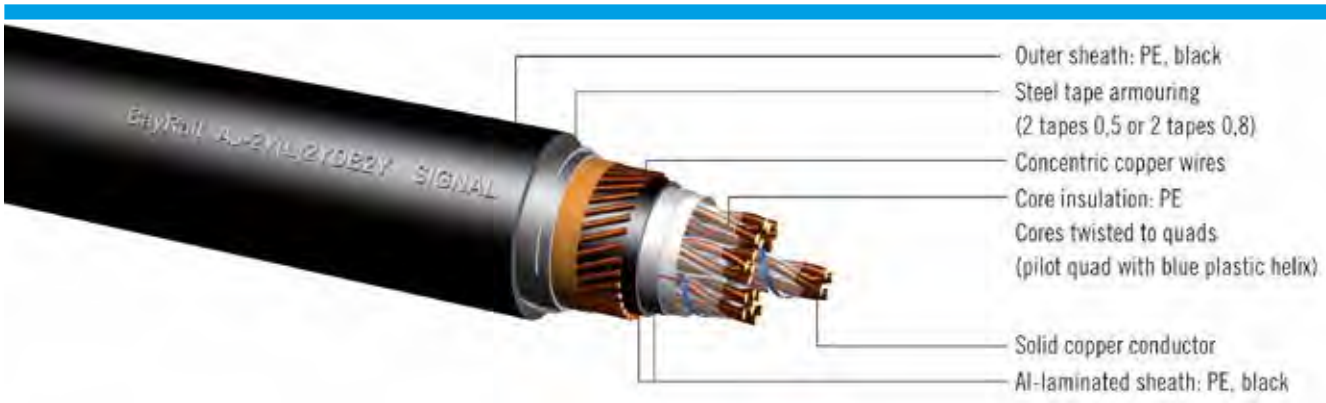
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y(L)2YDB2Y - quad stranded, (H45)

...x4x0,9 acc. to DB TL 416.0115




similar to the illustration


### Standards

Technical specifications 416.0115,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance (pair of cores) Ω/km | ≤ 56,6 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 |
| For the central quad nF/km | ≤ 50 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **(L)2Y** | laminated sheath made of polyethylene |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H45)** | maximum mutual capacitance value at 800 Hz, 45 nF/km |
| **rk** | reduction factor characteristic |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- AJ-2Y(L)2YDB2Y from 3x... to 40x...

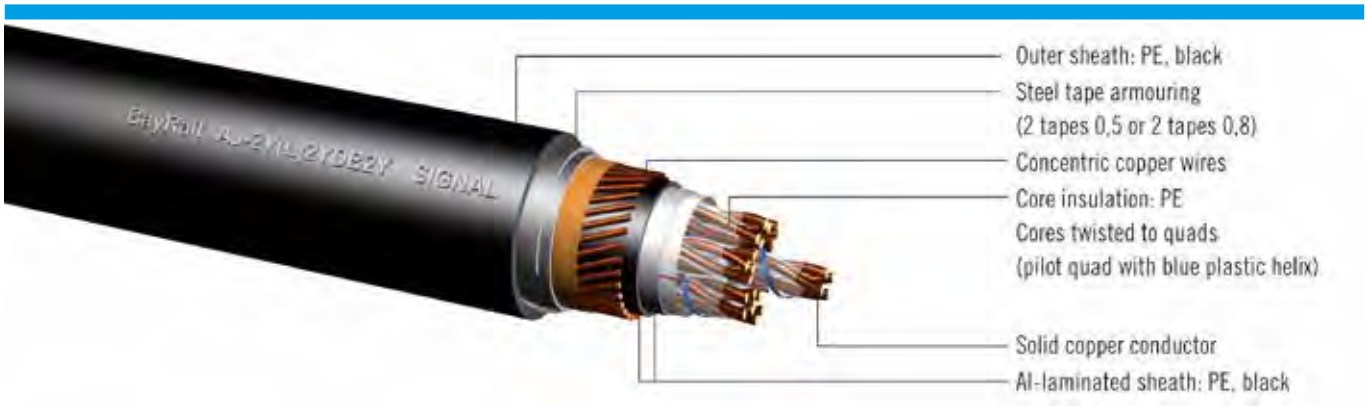
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y(L)2YDB2Y - quad stranded, (H45)

...x4x1,4 acc. to DB TL 416.0115




similar to the illustration


## Standards

Technical specifications 416.0115,
Engineering specifications 416.0116,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance (pair of cores) Ω/km | ≤ 23,4 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 |
| For the central quad nF/km | ≤ 50 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **(L)2Y** | laminated sheath made of polyethylene |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H45)** | maximum mutual capacitance value at 800 Hz, 45 nF/km |
| **rk** | reduction factor characteristic |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- AJ-2Y(L)2YDB2Y from 3x... to 40x...

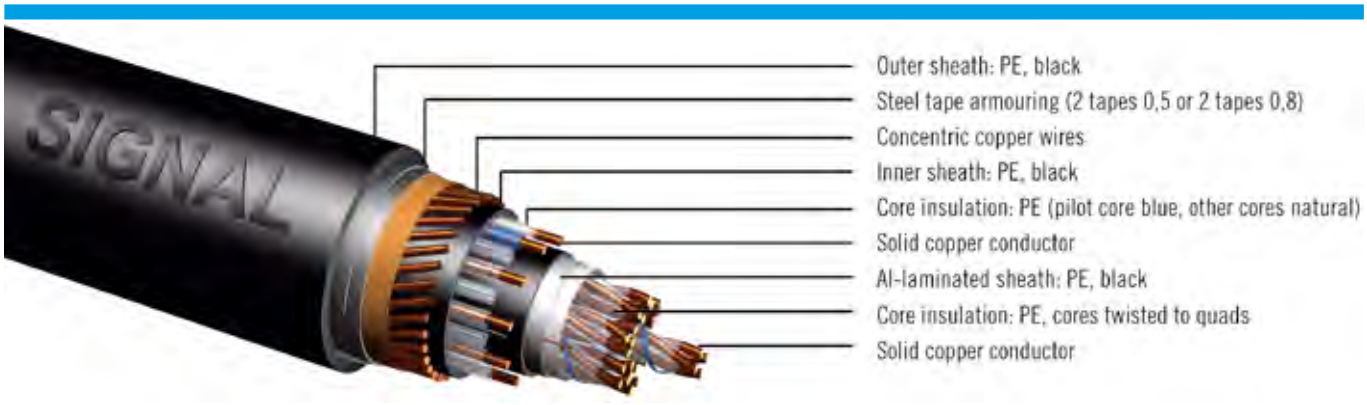
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y(L)2Y2YV / A-2Y(L)2Y2YB2Y / AJ-2Y(L)2Y2YDB2Y - quad and core-stranded

...x1x0,9 / 1,4 / 1,8 acc. to DB TL 416.0118




similar to the illustration


## Standards

Technical specifications 416.0118,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| **Conductor diameter mm** | **0,9** | **1,4** | **1,8** |
|---|---|---|---|
| Conductor resistance Ω/km | ≤ 28,9 | ≤ 11,9 | ≤ 7.2 |
| Insulation resistance GΩxkm | ≥ 10 | ≥ 10 | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 120 | ≤ 120 | ≤ 120 |
| **Quads** | | | |
| Conductor loop resistance Ω/km | ≤ 56,6 | ≤ 23,4 | |
| Insulation resistance GΩxkm | ≥ 10 | ≥ 10 | |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 | ≤ 45 | |
| For 1x4, 3x4, and/or central quad (in the first layer, only 1 quad), ≤ 52 nF applies | | | |
| Capacitative couplings at 800 Hz pF/500m | | | |
| $K_1$ | ≤ 650 | ≤ 650 | |
| C9-12 neighbouring quads | ≤ 500 | ≤ 500 | |
| C9-12 quads next to neighbouring quads | ≤ 150 | ≤ 150 | |
| ea1/2 | ≤ 1300 | ≤ 1300 | |
| Surge impedance at 40 kHz Ω | 130 ±12 % | 130 ±12 % | |
| Wave attenuation at 40 kHz dB/km | ≤ 2.6 | ≤ 1.5 | |
| Near-end crosstalk attenuation at 40 kHz (average value/min. single value) dB | | | |
| In the quad | ≥65/60 | ≥65/60 | |
| Neighbouring quads | ≥65/60 | ≥65/60 | |
| Quads next to neighbouring quads | ≥70/60 | ≥70/60 | |
| Quads in neighbouring layer | ≥75/65 | ≥75/65 | |
| **Alternating voltage test 50 Hz** | | | |
| Core/core, core/screen Veff | | 2500 | |
| **Temperature ranges** | | | |
| During laying, installing °C | | -10 to +60 | |
| Before and after laying, installing °C | | -40 to +60 | |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated. The combined signalling cables are suitable:

- for special use in safety installations
- for energy transfer in a cable, especially when, for the star quads, high symmetry with one another is required against external interferences and against earth potential, as is called for by AF and digital transmission.
- for transmission of direct current at an operating voltage of ≤ 600 V or of alternating currents ≤ 420 Veff.
- for especially long railway control distances during low-frequency (AF) or digital transmission.
- for earthing the cable screen on both sides according to the relevant requirements of DB AG.

The cables should be used where they provide benefits in a technical and/or economical sense.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **AJ** | outdoor cable with inductive protection |
| **2Y** | conductor insulation, sheath made of PE |
| **(L)2Y** | laminated sheath made of polyethylene |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2YV** | outer sheath made from PE, reinforced |
| **S** | signalling cable |
| **rk** | reduction factor characteristic |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications

## Product range

- AJ-2Y(L)2Y2YDB2Y 1x4x0,9 + 4x1x1,4 S to
- AJ-2Y(L)2Y2YDB2Y 7x4x1,4 + 10x1x1,8 S

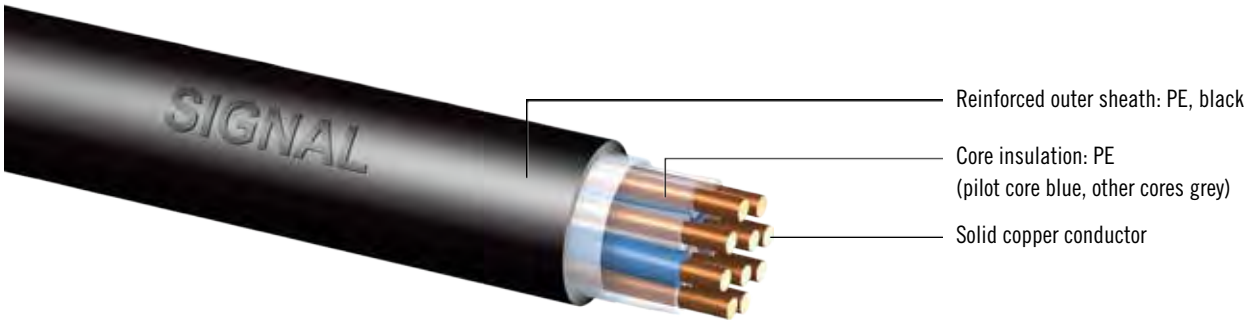
www.bayka.de

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y2YV - core-stranded, (H115) / (H145), reinforced outer sheath

...x1x0,9 acc. to DB TL 416.0113 (until 2007)




similar to the illustration


## Standards

Technical specifications 416.0113, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail® company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance Ω/km | ≤ 28,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km<br>For the central core nF/km | ≤ 115<br>≤ 120 |
| Alternating voltage test 50 Hz<br>Core-core Veff | 2500 |
| Operating voltage peak value<br>Direct current V<br>Alternating current Veff | <br>≤ 600<br>≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2YV** | outer sheath made of polyethylene, reinforced |
| **S** | signalling cable |
| **(H115)** | maximum mutual capacitance value at 800 Hz, 115 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2Y2YV 50x1x0,9 S (H115) - 2x1x0,9 to 200x1x0,9

- Use **www.bayka.de** or this QR-Code for our full portfolio:

*)

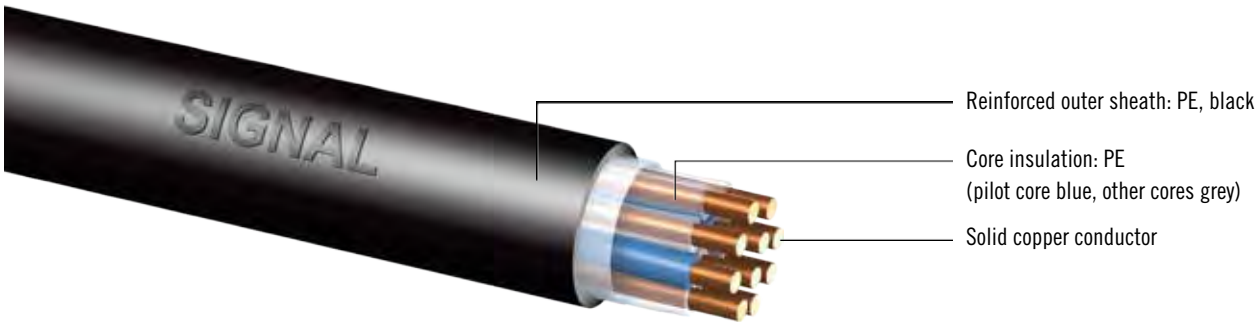
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y2YV - core-stranded, (H115) / (H145), reinforced outer sheath

...x1x1,4 acc. to DB TL 416.0113 (until 2007)




similar to the illustration


## Standards

Technical specifications 416.0113, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 145 |
| For the central core nF/km | ≤ 155 |
| Alternating voltage test 50 Hz | |
| Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2YV** | outer sheath made of polyethylene, reinforced |
| **S** | signalling cable |
| **(H115)** | maximum mutual capacitance value at 800 Hz, 115 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2Y2YV 50x1x1,4 S (H145) - 4x1x1,4 to 200x1x1,4

- Use **www.bayka.de** or this QR-Code for our full portfolio:

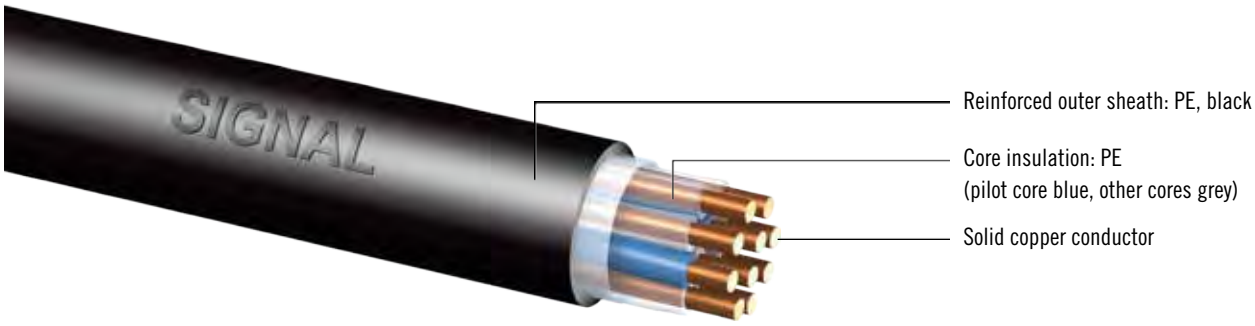
*)
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y2YV - core-stranded, (H115) / (H145), reinforced outer sheath

...x1x1,8 acc. to DB TL 416.0113 (until 2007)




similar to the illustration


## Standards

Technical specifications 416.0113, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail® company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance Ω/km | ≤ 7,2 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km<br>For the central core nF/km | ≤ 145<br>≤ 155 |
| Alternating voltage test 50 Hz<br>Core-core Veff | 2500 |
| Operating voltage peak value<br>Direct current V<br>Alternating current Veff | <br>≤ 600<br>≤ 420 |
| Temperature range °C<br>During laying, installing<br>Before and after laying, installing | <br>-10 to +60<br>-40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| A | outdoor cable |
| 2Y | insulating cover made of polyethylene (PE) |
| 2YV | outer sheath made of polyethylene, reinforced |
| S | signalling cable |
| (H115) | maximum mutual capacitance value at 800 Hz, 115 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2Y2YV 50x1x1,8 S (H115) - 4x1x1,8 to 200x1x1,8

- Use **www.bayka.de** or this QR-Code for our full portfolio:

*)

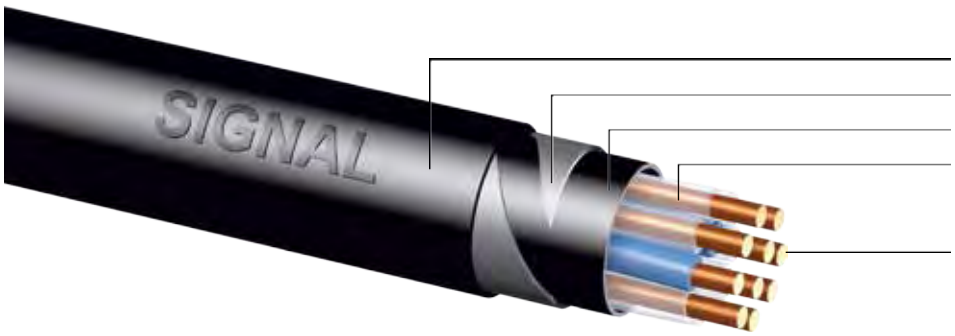
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y2YB2Y - core-stranded, (H115) / (H145), armoured, resp. with inductive protection

...x1x0,9 acc. to DB TL 416.0113 (until 2007)




similar to the illustration


### Standards

Technical specifications 416.0113, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance Ω/km | ≤ 28,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 115 |
| For the central core nF/km | ≤ 120 |
| Alternating voltage test 50 Hz | |
| Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2Y** | inner sheath made of polyethylene, reinforced |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H115)** | maximum mutual capacitance value at 800 Hz, 115 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- A-2Y2YB2Y 50x1x0,9 S (H115) - 2x1x0,9 to 140x1x0,9

- Use **www.bayka.de** or this QR-Code for our full portfolio:

*)
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y2YB2Y - core-stranded, (H115) / (H145), armoured, resp. with inductive protection

...x1x1,4 acc. to DB TL 416.0113 (until 2007)


similar to the illustration


## Standards

Technical specifications 416.0113, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 145 |
| For the central core nF/km | ≤ 155 |
| Alternating voltage test 50 Hz Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2Y** | inner sheath made of polyethylene, reinforced |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H145)** | maximum mutual capacitance value at 800 Hz, 145 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2Y2YB2Y 50x1x1,4 S (H145) - 4x1x1,4 to 60x1x1,4

- Use **www.bayka.de** or this QR-Code for our full portfolio:

*)

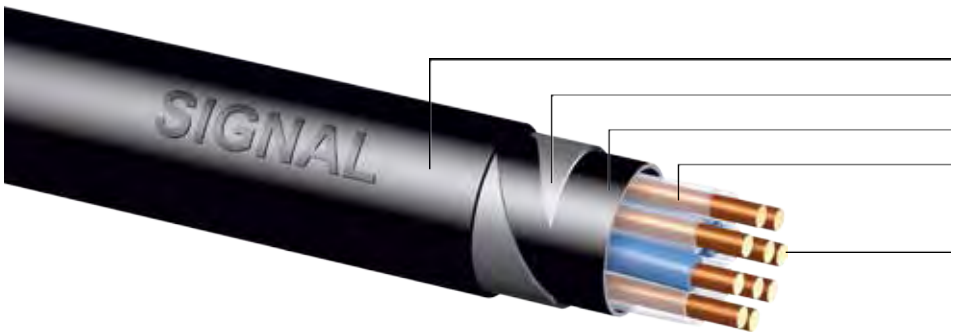
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y2YB2Y - core-stranded, (H115) / (H145), armoured, resp. with inductive protection

...x1x1,8 acc. to DB TL 416.0113 (until 2007)




similar to the illustration


## Standards

Technical specifications 416.0113, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance Ω/km | ≤ 7,2 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 145 |
| For the central core nF/km | ≤ 155 |
| Alternating voltage test 50 Hz | |
| Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2Y** | inner sheath made of polyethylene, reinforced |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H145)** | maximum mutual capacitance value at 800 Hz, 145 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2Y2YB2Y 50x1x0,9 S (H115) - 4x1x1,8 to 40x1x1,8

- Use **www.bayka.de** or this QR-Code for our full portfolio:

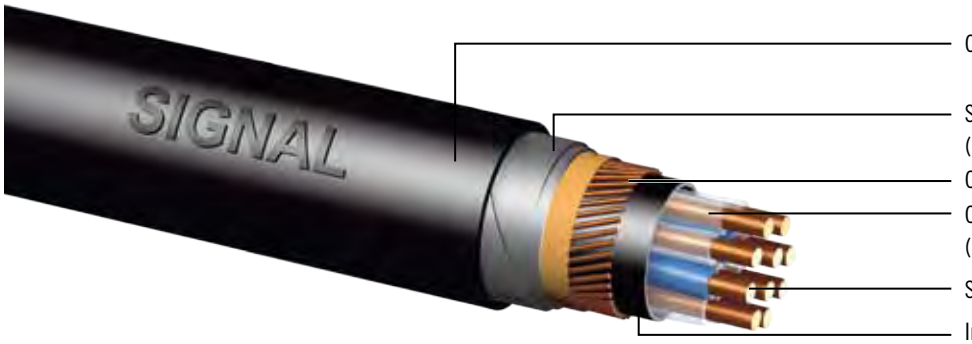
*)
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y2YDB2Y - core-stranded, (H115) / (H145), armoured, resp. with inductive protection

...x1x0,9 acc. to DB TL 416.0113 (until 2007)




similar to the illustration


### Standards

Technical specifications 416.0113, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance Ω/km | ≤ 28,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 115 |
| For the central core nF/km | ≤ 120 |
| Alternating voltage test 50 Hz Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2Y** | inner sheath made of polyethylene, reinforced |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H115)** | maximum mutual capacitance value at 800 Hz, 115 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- AJ-2Y2YDB2Y 50x1x0,9 S (H115) - 10x1x0,9 to 200x1x0,9

- Use **www.bayka.de** or this QR-Code for our full portfolio:

*)

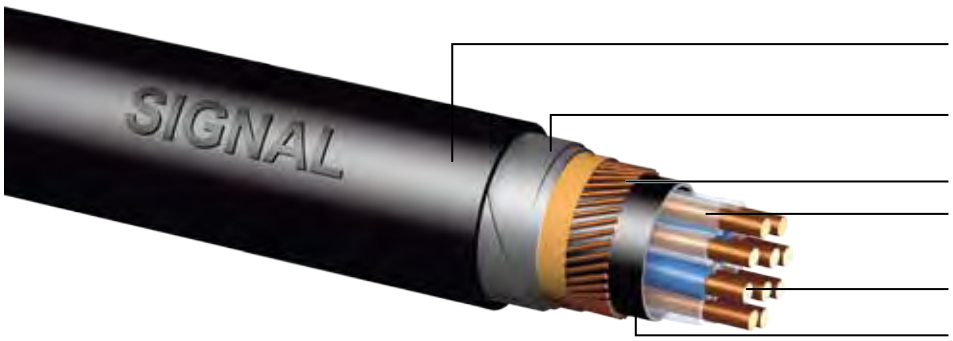
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y2YDB2Y - core-stranded, (H115) / (H145), armoured, resp. with inductive protection

...x1x1,4 acc. to DB TL 416.0113 (until 2007)




similar to the illustration


### Standards

Technical specifications 416.0113, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 145 |
| For the central core nF/km | ≤ 155 |
| Alternating voltage test 50 Hz | |
| Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2Y** | inner sheath made of polyethylene, reinforced |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H145)** | maximum mutual capacitance value at 800 Hz, 145 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- AJ-2Y2YDB2Y 50x1x1,4 S (H145) - 10x1x1,4 to 200x1x1,4

- Use **www.bayka.de** or this QR-Code for our full portfolio:

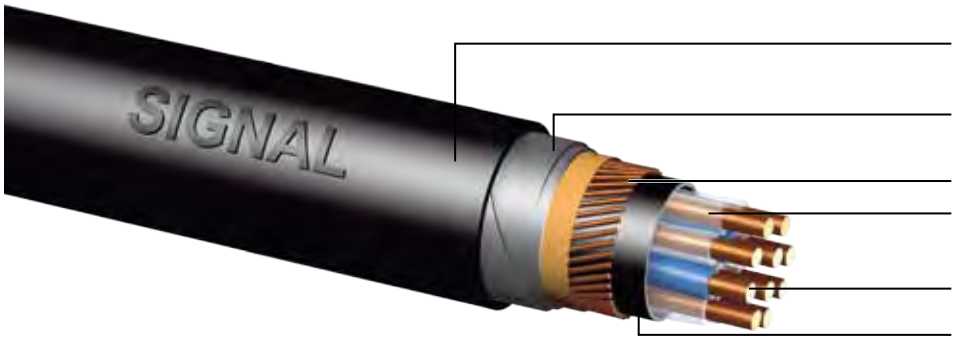
*)
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y2YDB2Y - core-stranded, (H115) / (H145), armoured, resp. with inductive protection

...x1x1,8 acc. to DB TL 416.0113 (until 2007)




similar to the illustration


### Standards

Technical specifications 416.0113, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance Ω/km | ≤ 7.2 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 145 |
| For the central core nF/km | ≤ 155 |
| Alternating voltage test 50 Hz Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2Y** | inner sheath made of polyethylene, reinforced |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H145)** | maximum mutual capacitance value at 800 Hz, 145 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- AJ-2Y2YDB2Y 50x1x1,8 S (H115) - 10x1x1,8 to 200x1x1,8

- Use **www.bayka.de** or this QR-Code for our full portfolio:

*)

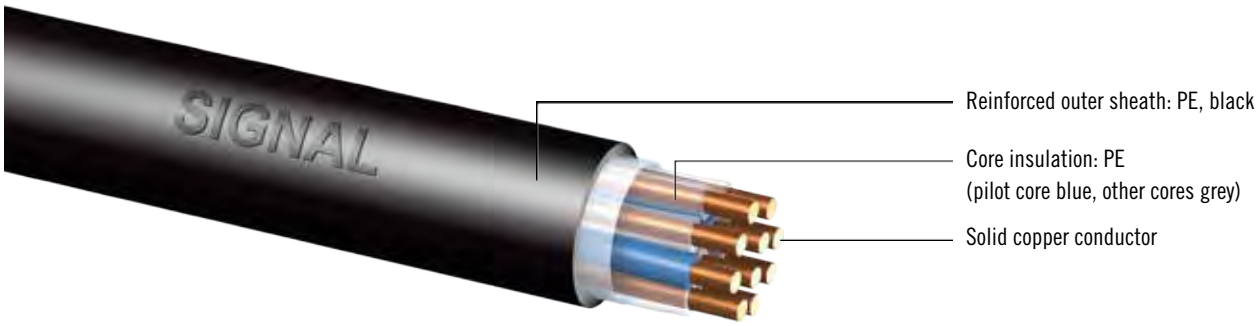
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y2YV - core-stranded, (H95), reinforced outer sheath

...x1x1,4 acc. to DB TL 416.0114 (until 2007)




similar to the illustration


## Standards

Technical specifications 416.0114, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 95 |
| For the central core nF/km | ≤ 105 |
| Alternating voltage test 50 Hz | |
| Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2YV** | outer sheath made of polyethylene, reinforced |
| **S** | signalling cable |
| **(H95)** | maximum mutual capacitance value at 800 Hz, 95 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2Y2YV 10x1x1,4 S (H95) - 10x1x1,4 to 50x1x1,4

- Use **www.bayka.de** or this QR-Code for our full portfolio:

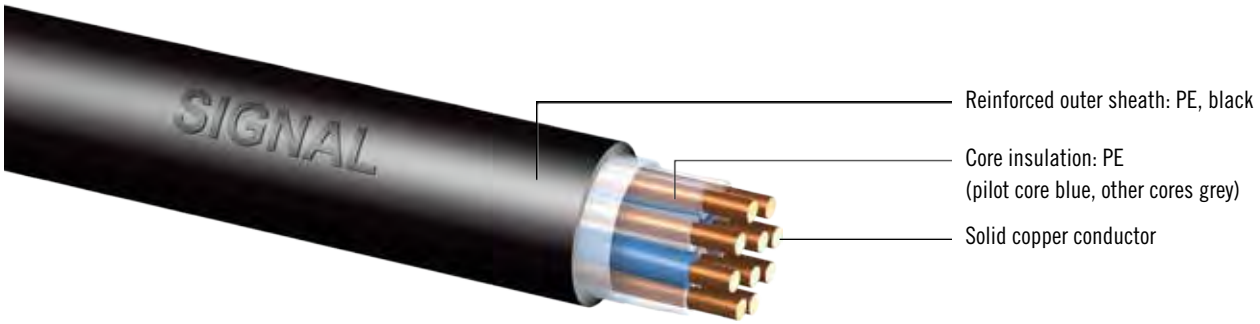
*)
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y2YV - core-stranded, (H95), reinforced outer sheath

...x1x1,8 acc. to DB TL 416.0114 (until 2007)




similar to the illustration


## Standards

Technical specifications 416.0114, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance Ω/km | ≤ 7.2 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km<br>For the central core nF/km | ≤ 145<br>≤ 155 |
| Alternating voltage test 50 Hz<br>Core-core Veff | 2500 |
| Operating voltage peak value<br>Direct current V<br>Alternating current Veff | <br>≤ 600<br>≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2YV** | outer sheath made of polyethylene, reinforced |
| **S** | signalling cable |
| **(H95)** | maximum mutual capacitance value at 800 Hz, 95 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2Y2YV 10x1x1,8 S (H95) - 10x1x1,8 to 50x1x1,8

- Use **www.bayka.de** or this QR-Code for our full portfolio:

*)

In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y2YB2Y - core-stranded, (H95), armoured, resp. with inductive protection

...x1x1,4 acc. to DB TL 416.0114 (until 2007)


similar to the illustration


## Standards

Technical specifications 416.0114, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 95 |
| For the central core nF/km | ≤ 105 |
| Alternating voltage test 50 Hz | |
| Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2Y** | outer sheath made of polyethylene, reinforced |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H95)** | maximum mutual capacitance value at 800 Hz, 95 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2Y2YB2Y 10x1x1,4 S (H95) - 10x1x1,4 to 20x1x1,4

- Use **www.bayka.de** or this QR-Code for our full portfolio:

*)
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y2YB2Y - core-stranded, (H95), armoured, resp. with inductive protection

...x1x1,8 acc. to DB TL 416.0114 (until 2007)


similar to the illustration


## Standards

Technical specifications 416.0114, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance Ω/km | ≤ 7.2 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 95 |
| For the central core nF/km | ≤ 105 |
| Alternating voltage test 50 Hz Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2Y** | outer sheath made of polyethylene, reinforced |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H95)** | maximum mutual capacitance value at 800 Hz, 95 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2Y2YB2Y 10x1x1,8 S (H95) - 10x1x1,8 to 14x1x1,8

- Use **www.bayka.de** or this QR-Code for our full portfolio:

*)

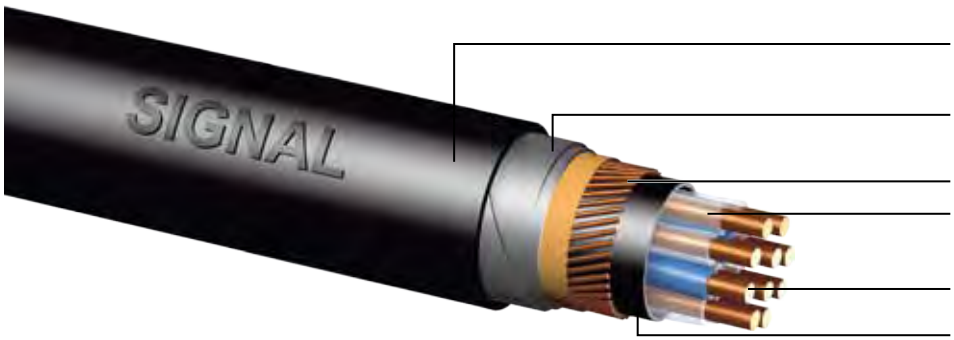
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y2YDB2Y - core-stranded, (H95), armoured, resp. with inductive protection

...x1x1,4 acc. to DB TL 416.0114 (until 2007)




similar to the illustration


## Standards

Technical specifications 416.0114, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 95 |
| For the central core nF/km | ≤ 105 |
| Alternating voltage test 50 Hz | |
| Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2Y** | outer sheath made of polyethylene, reinforced |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H95)** | maximum mutual capacitance value at 800 Hz, 95 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- AJ-2Y2YDB2Y 10x1x1,4 S (H95) - 10x1x1,4 to 50x1x1,4

- Use **www.bayka.de** or this QR-Code for our full portfolio:

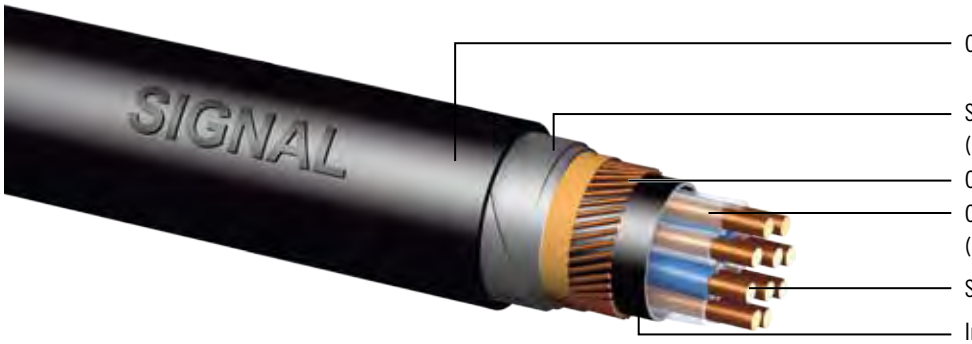
*)
In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y2YDB2Y - core-stranded, (H95), armoured, resp. with inductive protection

...x1x1,8 acc. to DB TL 416.0114 (until 2007)




similar to the illustration


### Standards

Technical specifications 416.0114, edition 1.1 - 2007 *), Engineering specifications 416.0116, edition 1.1 - 2007 *), Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH).

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance Ω/km | ≤ 7.2 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 95 |
| For the central core nF/km | ≤ 105 |
| Alternating voltage test 50 Hz Core-core Veff | 2500 |
| Operating voltage peak value | |
| Direct current V | ≤ 600 |
| Alternating current Veff | ≤ 420 |
| Temperature range °C | |
| During laying, installing | -10 to +60 |
| Before and after laying, installing | -40 to +60 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **2Y** | outer sheath made of polyethylene, reinforced |
| **D** | screen made of copper wires |
| **B** | armouring |
| **2Y** | outer protective sheath made of PE |
| **S** | signalling cable |
| **(H95)** | maximum mutual capacitance value at 800 Hz, 95 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- AJ-2Y2YDB2Y 10x1x1,8 S (H95) - 10x1x1,8 to 50x1x1,8

- Use **www.bayka.de** or this QR-Code for our full portfolio:

*)

In 2007, the technical specifications for unfilled, core-stranded signalling cables TL 416.0113 and 416.0114 were replaced by the technical specifications for filled, longitudinal and transverse watertight signalling cables. The Deutsche Bahn AG no longer uses the old, unfilled cables, the approval has expired.

Edition: 05/2016

# BayRail® - Signalling cables

## A-2YY - core-stranded, PVC sheath

...x1x0,9 acc. to DB Dlk 1.013.102y


similar to the illustration


## Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance (pair of cores) Ω/km | ≤ 28,9 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 100 |
| For the central cores and the cores in the outer layer | ≤ 110 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +60 |
| Before and after laying, installing °C | -30 to +60 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H100)** | maximum mutual capacitance value at 800 Hz, 100 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- A-2YY from 2x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2YY - core-stranded, PVC sheath

...x1x1,4 acc. to DB Dlk 1.013.102y


similar to the illustration


## Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance (pair of cores) Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 120 |
| For the central cores and the cores in the outer layer | ≤ 130 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +60 |
| Before and after laying, installing °C | -30 to +70 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H120)** | maximum mutual capacitance value at 800 Hz, 120 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- A-2YY from 2x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2YY - core-stranded, PVC sheath

...x1x1,8 acc. to DB Dlk 1.013.102y


similar to the illustration


## Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance (pair of cores) Ω/km | ≤ 7,2 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 130 |
| For the central cores and the cores in the outer layer | ≤ 140 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -30 to +70 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H130)** | maximum mutual capacitance value at 800 Hz, 130 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- A-2YY from 4x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2YYbY - core-stranded, armoured, PVC sheath

...x1x0,9 acc. to DB Dlk 1.013.102y


similar to the illustration


## Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance Ω/km | ≤ 28,9 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 100 |
| For the central cores and the cores in the outer layer | ≤ 110 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -30 to +70 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **Y** | inner sheath made of PVC |
| **b** | armouring, one layer steel tape 0.3 mm (1B 0.3) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H100)** | maximum mutual capacitance value at 800 Hz, 100 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- A-2YYbY from 2x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2YYbY - core-stranded, armoured, PVC sheath

...x1x1,4 acc. to DB Dlk 1.013.102y


similar to the illustration


## Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 120 |
| For the central cores and the cores in the outer layer | ≤ 130 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -30 to +70 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **Y** | inner sheath made of PVC |
| **b** | armouring, one layer steel tape 0.3 mm (1B 0.3) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H120)** | maximum mutual capacitance value at 800 Hz, 120 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- A-2YYbY from 2x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2YYbY - core-stranded, armoured, PVC sheath

...x1x1,8 acc. to DB Dlk 1.013.102y


similar to the illustration


## Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance Ω/km | ≤ 7,2 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 130 |
| For the central cores and the cores in the outer layer | ≤ 140 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -30 to +70 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **Y** | inner sheath made of PVC |
| **b** | armouring, one layer steel tape 0.3 mm (1B 0.3) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H130)** | maximum mutual capacitance value at 800 Hz, 130 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- A-2YYbY from 4x... to 56x...

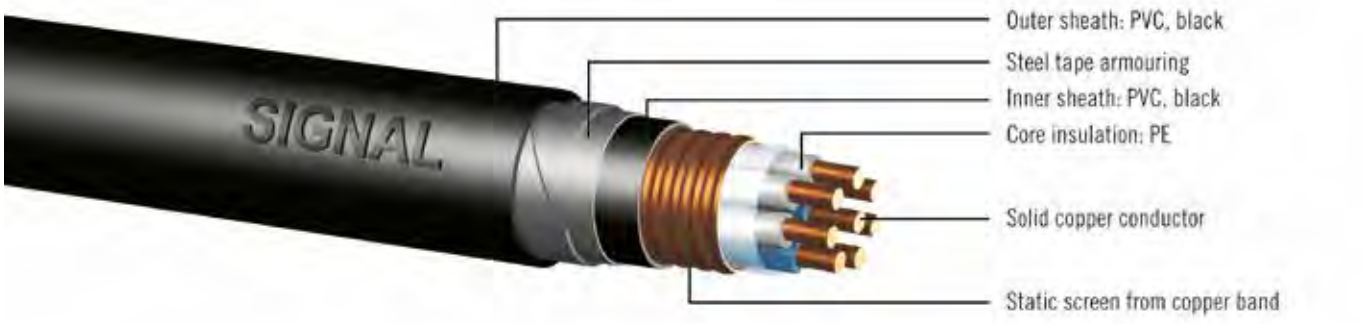
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y(St)YbY - core-stranded, screened, armoured, PVC sheath

...x4x0,9 acc. to DB Dlk 1.013.201y




similar to the illustration


### Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance Ω/km | ≤ 28,9 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 100 |
| **Capacitive couplings pF for 300 m at 800 Hz** | |
| $K_1$ | ≤ 400 |
| $K_{9-12}$ | ≤ 300 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -30 to +70 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **(St)** | static screen |
| **Y** | inner sheath made of PVC |
| **b** | armouring, two layers steel tape 0.5 mm (2B 0.5) and/or 0.8 mm (2B 0.8)) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H45)** | maximum mutual capacitance value at 800 Hz, 45 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

### Product range

- A-2Y(St)YbY from 1x... to 30x...

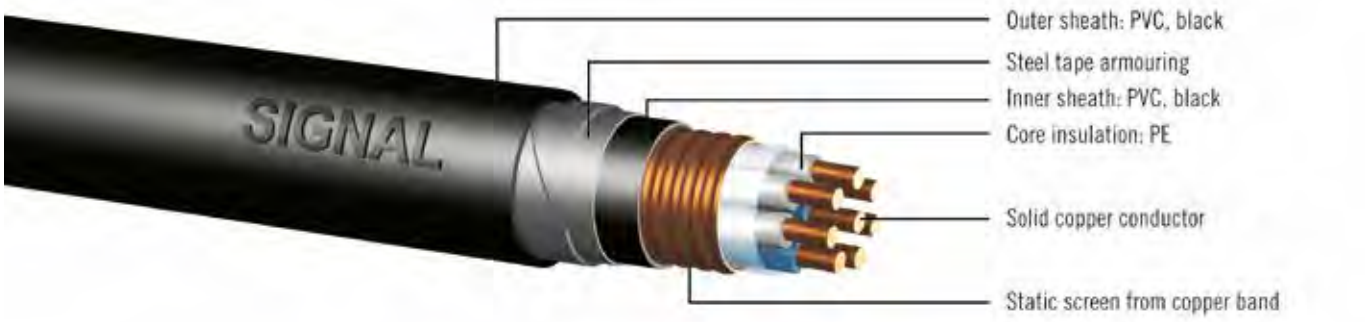
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y(St)YbY - core-stranded, screened, armoured, PVC sheath

...x4x1,4 acc. to DB Dlk 1.013.201y




similar to the illustration


## Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 23,4 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 50 |
| **Capacitive couplings pF for 300 m at 800 Hz** | |
| $K_1$ | ≤ 400 |
| $K_{9\text{-}12}$ | ≤ 300 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -30 to +70 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **(St)** | static screen |
| **Y** | inner sheath made of PVC |
| **b** | armouring, two layers steel tape 0.5 mm (2B 0.5) and/or 0.8 mm (2B 0.8)) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H50)** | maximum mutual capacitance value at 800 Hz, 50 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- A-2Y(St)YbY from 1x... to 30x...

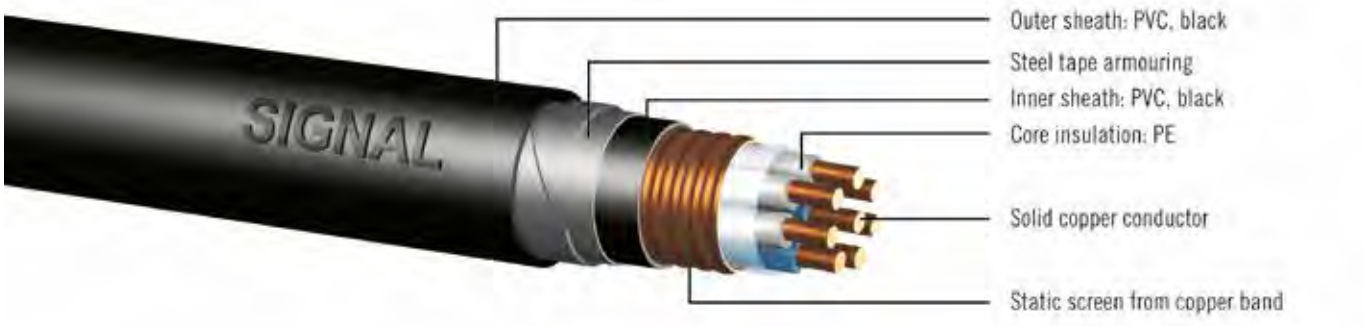
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y(St)YbY - core-stranded, with inductive protection, PVC sheath

...x1x0,9 acc. to DB Dlk 1.013.102y




similar to the illustration


### Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance Ω/km | ≤ 28,9 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 100 |
| For the central core nF/km | ≤ 110 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -30 to +70 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **(St)** | static screen |
| **Y** | inner sheath made of PVC |
| **b** | armouring, two layers steel tape 0.5 mm (2B 0.5) and/or 0.8 mm (2B 0.8)) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H100)** | maximum mutual capacitance value at 800 Hz, 100 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

### Product range

- AJ-2Y(St)YbY from 8x... to 200x...

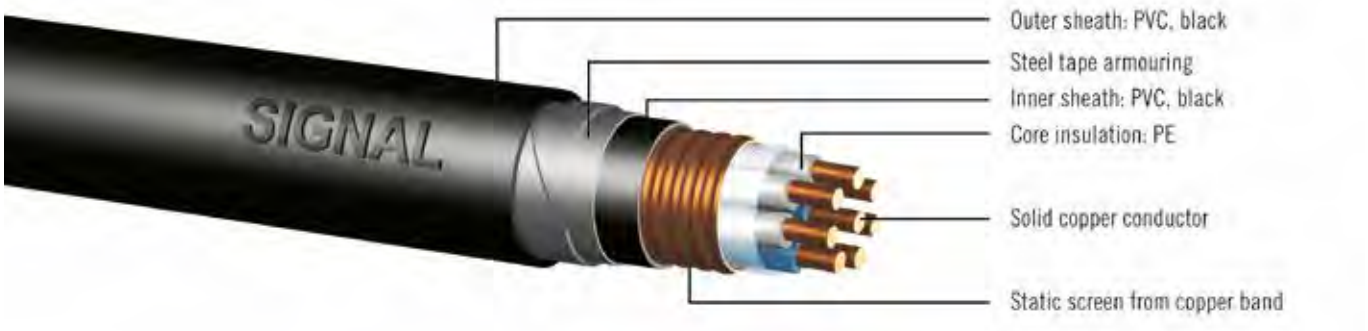
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y(St)YbY - core-stranded, with inductive protection, PVC sheath

...x1x1,4 acc. to DB Dlk 1.013.102y




similar to the illustration


### Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 120 |
| For the central core nF/km | ≤ 130 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -30 to +70 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **(St)** | static screen |
| **Y** | inner sheath made of PVC |
| **b** | armouring, two layers steel tape 0.5 mm (2B 0.5) and/or 0.8 mm (2B 0.8)) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H120)** | maximum mutual capacitance value at 800 Hz, 120 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

### Product range

- AJ-2Y(St)YbY from 8x... to 200x...

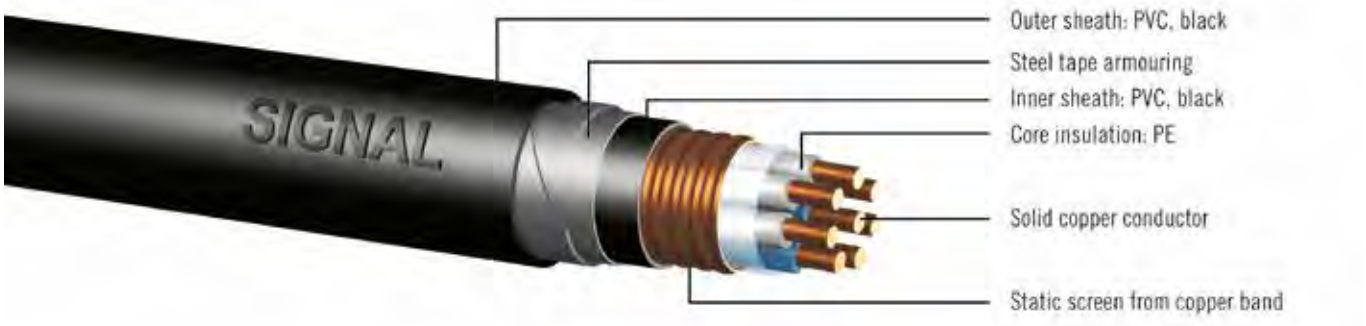
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y(St)YbY - core-stranded, with inductive protection, PVC sheath

...x1x1,8 acc. to DB Dlk 1.013.102y




similar to the illustration


### Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance Ω/km | ≤ 7,2 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 130 |
| For the central core nF/km | ≤ 140 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -30 to +70 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **(St)** | static screen |
| **Y** | inner sheath made of PVC |
| **b** | armouring, two layers steel tape 0.5 mm (2B 0.5) and/or 0.8 mm (2B 0.8)) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H120)** | maximum mutual capacitance value at 800 Hz, 120 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

### Product range

- AJ-2Y(St)YbY from 4x... to 133x...

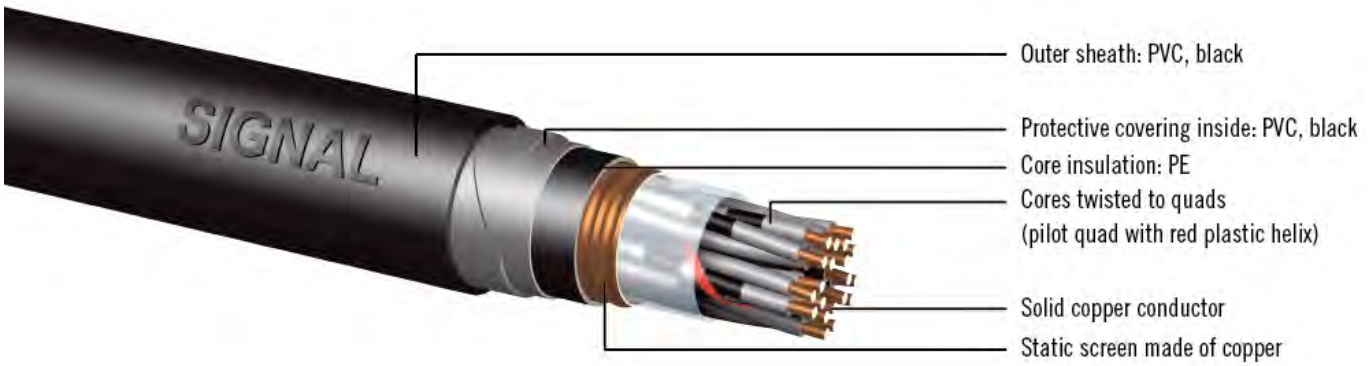
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y(St)YbY - quad stranded, with inductive protection and PVC-sheath

...x4x0,9 acc. to DB Dlk 1.013.201y




similar to the illustration


## Standards

Dlk 1.013.201y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance Ω/km | ≤ 56,6 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 |
| Capacitive couplings pF for 300 m at 800 Hz | |
| $K_1$ | ≤ 400 |
| $K_{9\text{-}12}$ | ≤ 300 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -30 to +70 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

## Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **(St)** | static screen |
| **Y** | inner sheath made of PVC |
| **b** | armouring, two layers steel tape 0.5 mm (2B 0.5) and/or 0.8 mm (2B 0.8) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H45)** | maximum mutual capacitance value at 800 Hz, 45 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- AJ-2Y(St)YbY from 3x... to 40x...

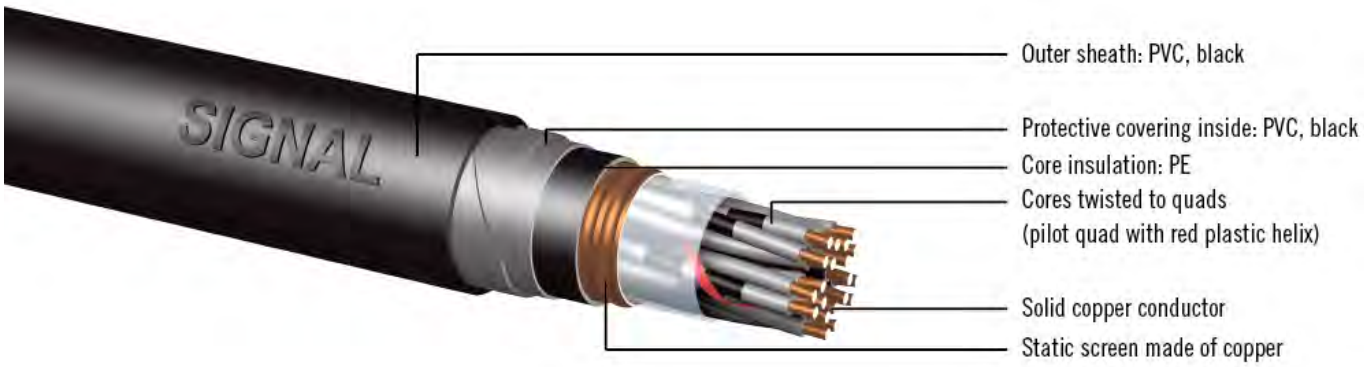
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## AJ-2Y(St)YbY - quad stranded, with inductive protection and PVC-sheath

...x4x1,4 acc. to DB Dlk 1.013.201y




similar to the illustration


### Standards

Dlk 1.013.102y and/or DIN VDE 0816-part 2.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 23,4 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 50 |
| Capacitive couplings pF for 300 m at 800 Hz | |
| $K_1$ | ≤ 400 |
| $K_{9-12}$ | ≤ 300 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -30 to +70 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated.

### Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **2Y** | insulating cover made of polyethylene (PE) |
| **(St)** | static screen |
| **Y** | inner sheath made of PVC |
| **b** | armouring, two layers steel tape 0.5 mm (2B 0.5) and/or 0.8 mm (2B 0.8)) |
| **Y** | outer sheath made of PVC |
| **S** | signalling cable |
| **(H50)** | maximum mutual capacitance value at 800 Hz, 50 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- AJ-2Y(St)YbY from 3x... to 40x...

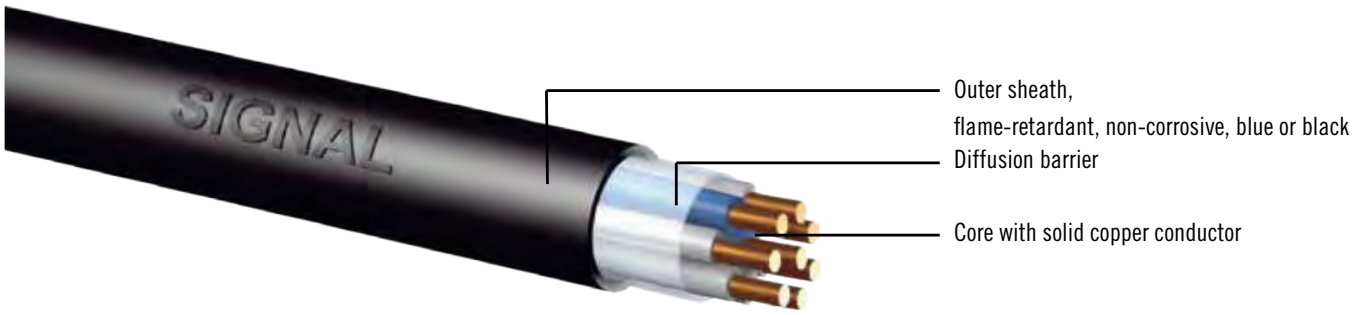
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-HHv - core-stranded, flame retardant, non corrosive, FRNC/LSOH

...x1x0,9 acc. to Bayka standard, based on DB Dlk 1.013.102y




similar to the illustration


## Standards

Bayka company standard BayRail®,
electrical properties based on Dlk 1.013.102y,
flame propagation according to DIN VDE 0472,
part 804, test method C,
smoke density according to DIN VDE 0482,
part 1034-2 (EN61034-2),
corrosivity of fire gases according to DIN VDE 0482,
part 267-2-2 (EN 50267-2-2),
toxicity according to DIN VDE 0260, part 305 (EN50305), limit based on EN50306-1, 2 and 3 for hazard level: max. 5 (for insulation, extruded sheath, reinforcing outer sheath).

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance Ω/km | ≤ 28,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 105 |
| for cores in the inner layer | ≤ 110 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |
| Integrated monitoring cores from 10x1 on | |

## Application

Signalling cable, optimised for installation, transversally water-tight, flame-retardant for railway control centres and surveillance systems, etc., suitable for installation in open air, in the ground, in cable tray channels, and for laying in tunnels and buildings.

The cable is halogen-free, flame-retardant, and with low smoke density, and therefore suitable for installation in areas with special hazards caused by fire propagation.

VDE approved and system-tested sleeves and conduits are available for this cable.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **H** | Core insulation halogen-free |
| **Hv** | outer sheath, reinforced, halogen-free, flame-retardant, cable with improved behaviour in the event of fire |
| **S** | signalling cable |
| **LG** | stranded in layers |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-HHV from 4x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-HHv - core-stranded, flame retardant, non corrosive, FRNC/LSOH

...x1x1,4 acc. to DB Dlk 1.013.102y


similar to the illustration


## Standards

Bayka company standard BayRail®,
electrical properties based on Dlk 1.013.102y,
flame propagation according to DIN VDE 0472,
part 804, test method C,
smoke density according to DIN VDE 0482,
part 1034-2 (EN61034-2),
corrosivity of fire gases according to DIN VDE 0482,
part 267-2-2 (EN 50267-2-2),
toxicity according to DIN VDE 0260, part 305 (EN50305), limit based on EN50306-1, 2 and 3 for hazard level: max. 5 (for insulation, extruded sheath, reinforcing outer sheath).

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 120 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |
| Integrated monitoring cores from 10x1 on | |

## Application

Signalling cable, optimised for installation, transversally water-tight, flame-retardant for railway control centres and surveillance systems, etc., suitable for installation in open air, in the ground, in cable tray channels, and for laying in tunnels and buildings.

The cable is halogen-free, flame-retardant, and with low smoke density, and therefore suitable for installation in areas with special hazards caused by fire propagation.

VDE approved and system-tested sleeves and conduits are available for this cable.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **H** | core insulation halogen-free |
| **Hv** | outer sheath, reinforced, halogen-free, flame-retardant, cable with improved behaviour in the event of fire |
| **S** | signalling cable |
| **LG** | stranded in layers |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-HHV from 4x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-HHv - core-stranded, flamne retardant, non corrosive, FRNC/LSOH

...x1x1,8 acc. to Bayka standard, based on DB Dlk 1.013.102y


similar to the illustration


## Standards

Bayka company standard BayRail®,
electrical properties based on Dlk 1.013.102y,
flame propagation according to DIN VDE 0472,
part 804, test method C,
smoke density according to DIN VDE 0482,
part 1034-2 (EN61034-2),
corrosivity of fire gases according to DIN VDE 0482,
part 267-2-2 (EN 50267-2-2),
toxicity according to DIN VDE 0260, part 305 (EN50305), limit based on EN50306-1, 2 and 3 for hazard level: max. 5 (for insulation, extruded sheath, reinforcing outer sheath).

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance Ω/km | ≤ 7,2 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 120 |
| for cores in the inner layer | ≤ 130 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |
| Integrated monitoring cores from 10x1 on | |

## Application

Signalling cable, optimised for installation, transversally water-tight, flame-retardant for railway control centres and surveillance systems, etc., suitable for installation in open air, in the ground, in cable tray channels, and for laying in tunnels and buildings.

The cable is halogen-free, flame-retardant, and with low smoke density, and therefore suitable for installation in areas with special hazards caused by fire propagation.

VDE approved and system-tested sleeves and conduits are available for this cable.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **H** | conductor insulation, halogen-free |
| **HV** | outer sheath, reinforced, halogen-free, flame-retardant, cable with improved behaviour in the event of fire |
| **S** | signalling cable |
| **LG** | stranded in layers |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-HHV from 4x... to 80x...

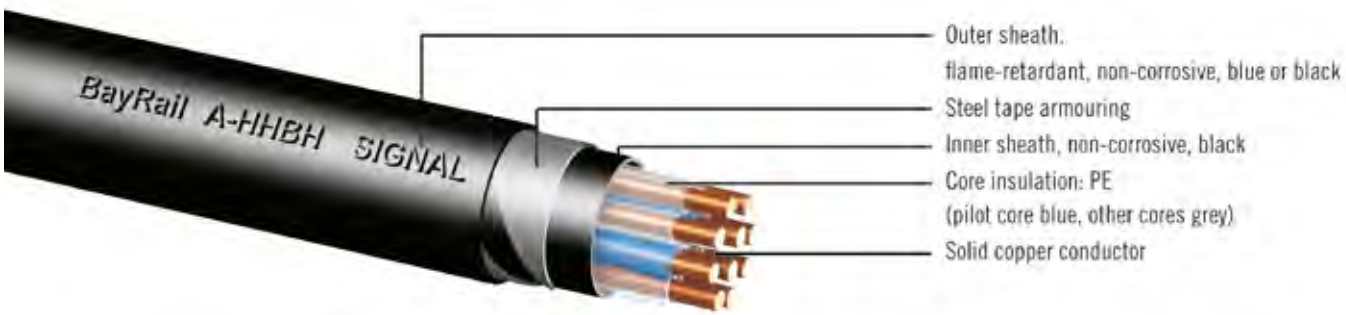
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-HHBH - core-stranded, armoured, flame retardant, non corrosive, FRNC/LSOH

...x1x0,9 acc. to Bayka standard, based on DB Dlk 1.013.102y




similar to the illustration


### Standards

Bayka company standard BayRail®,
electrical properties based on Dlk 1.013.102y,
flame propagation according to DIN VDE 0472,
part 804, test method C,
smoke density according to DIN VDE 0482,
part 1034-2 (EN61034-2),
corrosivity of fire gases according to DIN VDE 0482,
part 267-2-2 (EN 50267-2-2),
toxicity according to DIN VDE 0260, part 305 (EN50305), limit based on EN50306-1, 2 and 3 for hazard level: max. 5 (for insulation, inner sheath, outer sheath).

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance Ω/km | ≤ 28,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 105 |
| Cores in the inner layer | ≤ 110 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |
| Integrated monitoring cores from 10x1 on | |

### Application

Signalling cable, optimised for installation, transversally water-tight, flame-retardant for railway control centres and surveillance systems, etc., suitable for installation in open air, in the ground, in cable tray channels, and for laying in tunnels and buildings.

The cable is halogen-free, flame-retardant, and with low smoke density, and therefore suitable for installation in areas with special hazards caused by fire propagation.

VDE approved and system-tested sleeves and conduits are available for this cable.

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **H** | conductor insulation, halogen-free |
| **H** | inner sheath, halogen-free |
| **B** | armouring, 2 layers, steel tape 0.1 or 0.2 mm |
| **H** | outer sheath, halogen-free, frame-retardant |
| **S** | signalling cable |
| **LG** | stranded in layers |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- A-HHBH from 4x... to 200x...

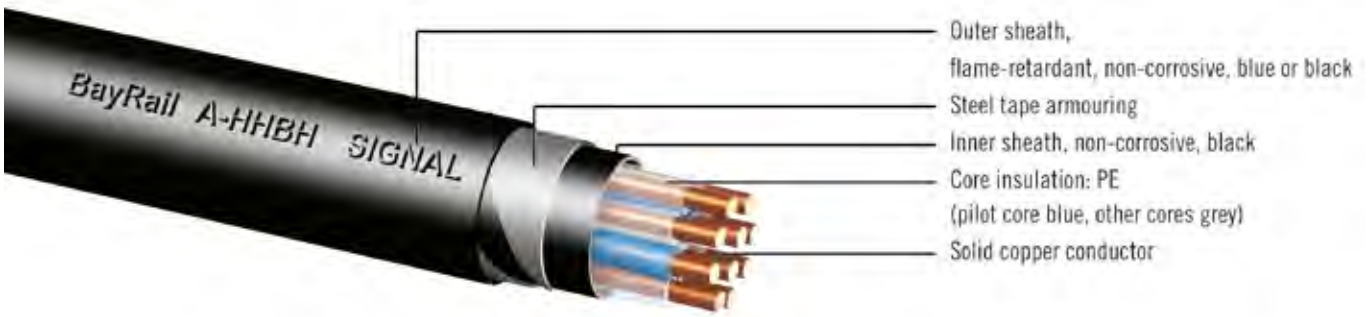
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-HHBH - core-stranded, armoured, flame retardant, non corrosive, FRNC/LSOH

...x1x1,4 acc. to Bayka standard, based on DB Dlk 1.013.102y




similar to the illustration


## Standards

Bayka company standard BayRail®,
electrical properties based on Dlk 1.013.102y,
flame propagation according to DIN VDE 0472,
part 804, test method C,
smoke density according to DIN VDE 0482,
part 1034-2 (EN61034-2),
corrosivity of fire gases according to DIN VDE 0482,
part 267-2-2 (EN 50267-2-2),
toxicity according to DIN VDE 0260, part 305 (EN50305), limit based on EN50306-1, 2 and 3 for hazard level: max. 5 (for insulation, inner sheath, outer sheath).

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 11,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 120 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |
| Integrated monitoring cores from 10x1 on | |

## Application

Signalling cable, optimised for installation, transversally water-tight, flame-retardant and rodent-proof for railway control centres and surveillance systems, etc., suitable for installation in open air, in the ground, in cable tray channels, and for laying in tunnels and buildings.

The cable is halogen-free, flame-retardant, and with low smoke density, and therefore suitable for installation in areas with special hazards caused by fire propagation.

VDE approved and system-tested sleeves and conduits are available for this cable.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **H** | conductor insulation, halogen-free |
| **H** | inner sheath, halogen-free |
| **B** | armouring, 2 layers, steel tape 0.1 or 0.2 mm |
| **H** | outer sheath, halogen-free, frame-retardant |
| **S** | signalling cable |
| **LG** | stranded in layers |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-HHBH from 4x... to 200x...

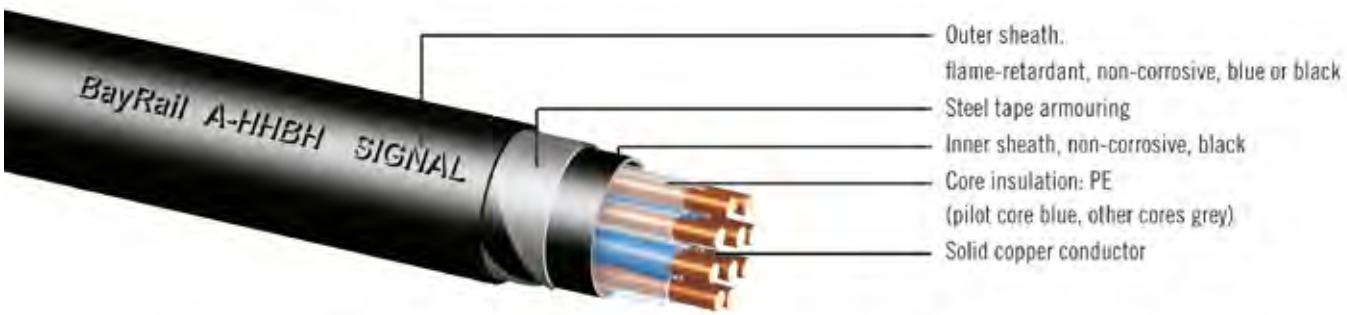
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-HHBH - core-stranded, armoured, flame retardant, non corrosive, FRNC/LSOH

...x1x1,8 acc. to Bayka standard, based on DB Dlk 1.013.102y




similar to the illustration


### Standards

Bayka company standard BayRail®,
electrical properties based on Dlk 1.013.102y,
flame propagation according to DIN VDE 0472,
part 804, test method C,
smoke density according to DIN VDE 0482,
part 1034-2 (EN61034-2),
corrosivity of fire gases according to DIN VDE 0482,
part 267-2-2 (EN 50267-2-2),
toxicity according to DIN VDE 0260, part 305 (EN50305), limit based on EN50306-1, 2 and 3 for hazard level: max. 5 (for insulation, inner sheath, outer sheath).

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,8 |
| Conductor resistance Ω/km | ≤ 7,2 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 120 |
| Cores in the inner layer | ≤ 130 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |
| Integrated monitoring cores from 10x1 on | |

### Application

Signalling cable, optimised for installation, transversally watertight, flame-retardant for railway control centres and surveillance systems, etc., suitable for installation in open air, in the ground, in cable tray channels, and for laying in tunnels and buildings.

The cable is halogen-free, flame-retardant, and with low smoke density, and therefore suitable for installation in areas with special hazards caused by fire propagation.

VDE approved and system-tested sleeves and conduits are available for this cable.

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **H** | conductor insulation, halogen-free |
| **H** | inner sheath, halogen-free |
| **B** | armouring, 2 layers, steel tape 0.1 or 0.2 mm |
| **H** | outer sheath, halogen-free, frame-retardant |
| **S** | signalling cable |
| **LG** | stranded in layers |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- A-HHBH 4x... to 30x...

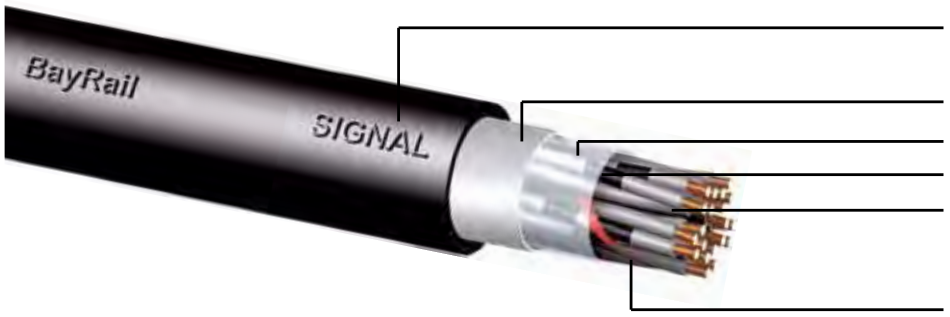
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-H(L)HV - quad stranded, flame retardant, non corrosive, FRNC/LSOH

...x4x0,9 acc. to Bayka standard, based on DB Dlk 1.013.201y




Outer sheath,
flame-retardant, non-corrosive, blue or black
Al tape with drain wire
Core covering
Core insulation: PE
Cores twisted to quads
(pilot quad with blue plastic helix)
Solid copper conductor

similar to the illustration


## Standards

Bayka company standard BayRail®,
electrical properties based on Dlk 1.013.201y,
flame propagation according to DIN VDE 0472,
part 804, test method C,
smoke density according to DIN VDE 0482,
part 1034-2 (EN61034-2),
corrosivity of fire gases according to DIN VDE 0482,
part 267-2-2 (EN 50267-2-2),
toxicity according to DIN VDE 0260, part 305 (EN50305), limit based on EN50306-1, 2 and 3 for hazard level: max. 5 (for insulation, extruded sheath, reinforcing outer sheath).

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance Ω/km | ≤ 56,6 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 |
| Capacitative couplings at 800 Hz pF/300m | |
| $k_1$ | ≤ 400 |
| $k_{9\text{-}12}$ neighbouring/next to neighbouring | ≤ 300/100 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

Integrated monitoring cores from 5x4 on

## Application

As signalling cable in railway control centres and surveillance systems, etc., suitable for laying in the ground optimised for installation, transversally watertight, flame-retardant and in cable ducts, as well as for threading into cable conduits.

The cable is halogen-free, flame retardant and with low smoke density. It is suitable for installation in tunnels and in areas with special hazards caused by fire propagation.

VDE approved and system-tested sleeves are available for this cable.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **H** | conductor insulation, halogen-free |
| **(L)HV** | laminated sheath, reinforced, halogen-free, flame retardant |
| **S** | signalling cable |
| **LG** | quads stranded in layers |
| **(H45)** | maximum mutual capacitance value at 800 Hz |
| **(M-SW)** | outer sheath, black |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-H(L)Hv from 1x... to 30x...

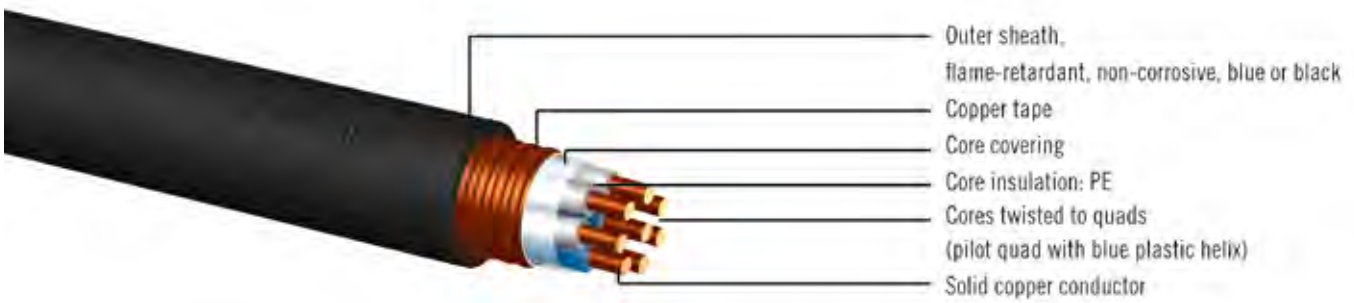
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-H(St)HV - quad stranded, flame retardant, non corrosive, FRNC/LSOH

...x4x0,9 acc. to Bayka standard, based on DB Dlk 1.013.201y




similar to the illustration


## Standards

Bayka company standard BayRail®,
electrical properties based on Dlk 1.013.201y,
flame propagation according to DIN VDE 0472,
part 804, test method C,
smoke density according to DIN VDE 0482,
part 1034-2 (EN61034-2),
corrosivity of fire gases according to DIN VDE 0482,
part 267-2-2 (EN 50267-2-2),
toxicity according to DIN VDE 0260, part 305 (EN50305), limit based on EN50306-1, 2 and 3 for hazard level: max. 5 (for insulation, extruded sheath, reinforcing outer sheath).

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance (pair of cores) Ω/km | ≤ 56,6 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 |
| Capacitive couplings pF (for 300 m at 800 Hz) | |
| $k_1$ | ≤ 400 |
| $k_{9\text{-}12}$ neighbouring/next to neighbouring | ≤ 300/100 |

**Alternating voltage test 50 Hz**

| | |
|---|---|
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |

**Temperature ranges**

| | |
|---|---|
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

Integrated monitoring cores from 5x4 on

## Application

Signalling cable, optimised for installation, transversally water-tight, flame-retardant for railway control centres and surveillance systems, etc., suitable for installation in open air, in the ground, in cable tray channels, and for laying in tunnels and buildings.

The cable is halogen-free, flame-retardant, and with low smoke density, and therefore suitable for installation in areas with special hazards caused by fire propagation.

VDE approved and system-tested sleeves and conduits are available for this cable.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **H** | conductor insulation, halogen-free |
| **(ST)** | static screen (Cu tape) |
| **HV** | outer sheath, reinforced, halogen-free, flame retardant |
| **S** | signalling cable |
| **LG** | quads stranded in layers |
| **(H45)** | maximum mutual capacitance value at 800 Hz |
| **(M-SW)** | outer sheath, black |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-H(St)Hv from 1x... to 30x...

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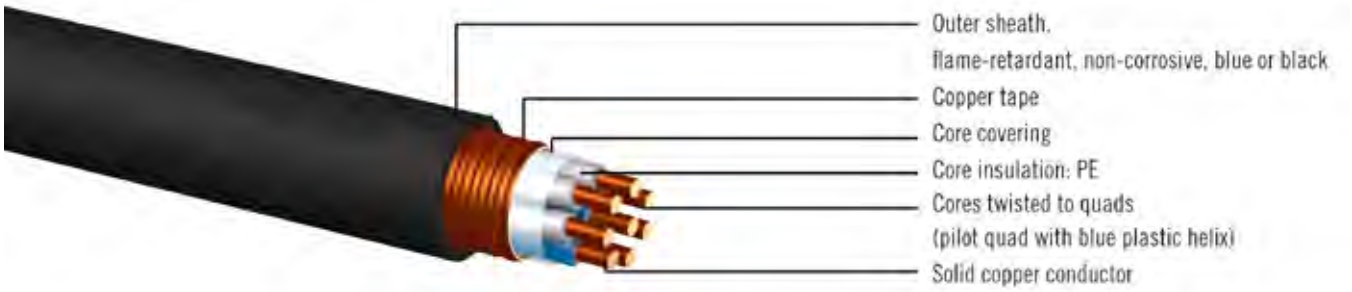
Edition: 05/2016

# BayRail® - Signalling cables

## A-H(St)HV - quad stranded, flame retardant, non corrosive, FRNC/LSOH

...x4x1,4 acc. to Bayka standard, based on DB Dlk 1.013.201y




similar to the illustration


## Standards

Bayka company standard BayRail®,
electrical properties based on Dlk 1.013.201y,
flame propagation according to DIN VDE 0472,
part 804, test method C,
smoke density according to DIN VDE 0482,
part 1034-2 (EN61034-2),
corrosivity of fire gases according to DIN VDE 0482,
part 267-2-2 (EN 50267-2-2),
toxicity according to DIN VDE 0260, part 305 (EN50305), limit based on EN50306-1, 2 and 3 for hazard level: max. 5 (for insulation, extruded sheath, reinforcing outer sheath).

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance Ω/km | ≤ 23,4 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 |
| Capacitative couplings at 800 Hz pF/300m | |
| $k_1$ | ≤ 400 |
| $k_{9\text{-}12}$ neighbouring/next to neighbouring | ≤ 300/100 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

Integrated monitoring cores from 5x4 on

## Application

As signalling cable in railway control centres and surveillance systems, etc., suitable for laying in the ground and in cable ducts, as well as for threading into cable conduits.

The cable is halogen-free, flame retardant and with low smoke density. It is suitable for installation in tunnels and in areas with special hazards caused by fire propagation.

VDE approved and system-tested sleeves are available for this cable.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **H** | conductor insulation, halogen-free |
| **(ST)** | static screen (Cu tape) |
| **HV** | outer sheath, reinforced, halogen-free, flame retardant |
| **S** | signalling cable |
| **LG** | quads stranded in layers |
| **(H45)** | maximum mutual capacitance value at 800 Hz |
| **(M-SW)** | outer sheath, black |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-H(St)Hv from 1x... to 30x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## A-H(L)HBH - quad stranded, armoured, flame retardant, non corrosive, FRNC/LSOH

...x4x0,9 acc. to Bayka standard, based on DB Dlk 1.013.201y


Outer sheath,
flame-retardant, non-corrosive, blue or black
Steel tape armouring
Inner sheath, non-corrosive, black
Al tape with drain wire
Core insulation: PE
Cores twisted to quads
(pilot quad with blue plastic helix)
Solid copper conductor

similar to the illustration


## Standards

Bayka company standard BayRail®,
electrical properties based on Dlk 1.013.201y,
flame propagation according to DIN VDE 0472,
part 804, test method C,
smoke density according to DIN VDE 0482,
part 1034-2 (EN61034-2),
corrosivity of fire gases according to DIN VDE 0482,
part 267-2-2 (EN 50267-2-2),
toxicity according to DIN VDE 0260, part 305 (EN50305), limit based on EN50306-1, 2 and 3 for hazard level: max. 5 (for insulation, inner sheath, outer sheath).

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance (pair of cores) Ω/km | ≤ 56,6 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 |
| Capacitive couplings pF (for 300 m at 800 Hz) | |
| $k_1$ | ≤ 400 |
| $k_{9-12}$ neighbouring/next to neighbouring | ≤ 300/100 |

**Alternating voltage test 50 Hz**

| | |
|---|---|
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |

**Temperature ranges**

| | |
|---|---|
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

Integrated monitoring cores from 5x4 on

## Application

Signalling cable, optimised for installation, transversally water-tight, flame-retardant for railway control centres and surveillance systems, etc., suitable for installation in open air, in the ground, in cable tray channels, and for laying in tunnels and buildings.

The cable is halogen-free, flame-retardant, and with low smoke density, and therefore suitable for installation in areas with special hazards caused by fire propagation.

VDE approved and system-tested sleeves and conduits are available for this cable.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **H** | conductor insulation, halogen-free |
| **(L)H** | inner sheath, halogene-free, with Al tape |
| **B** | armouring, 2 layers, steel tape 0.1 or 0.2 mm |
| **H** | outer sheath, halogen-free, frame-retardant |
| **S** | signalling cable |
| **Lg** | stranded in layers |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-H(L)HBH from 1x... to 30x...

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Edition: 05/2016

# BayRail® - Signalling cables

## A-H(L)HBH - quad stranded, armoured, flame retardant, non corrosive, FRNC/LSOH

...x4x1,4 acc. to Bayka standard, based on DB Dlk 1.013.201y


Outer sheath,
flame-retardant, non-corrosive, blue or black
Steel tape armouring
Inner sheath, non-corrosive, black
Al tape with drain wire
Core insulation: PE
Cores twisted to quads
(pilot quad with blue plastic helix)
Solid copper conductor

similar to the illustration


## Standards

Bayka company standard BayRail®,
electrical properties based on Dlk 1.013.201y,
flame propagation according to DIN VDE 0472,
part 804, test method C,
smoke density according to DIN VDE 0482,
part 1034-2 (EN61034-2),
corrosivity of fire gases according to DIN VDE 0482,
part 267-2-2 (EN 50267-2-2),
toxicity according to DIN VDE 0260, part 305 (EN50305), limit based on EN50306-1, 2 and 3 for hazard level: max. 5 (for insulation, inner sheath, reinforcing outer sheath).

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor resistance (pair of cores) Ω/km | ≤ 23,4 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 |
| Capacitive couplings pF (for 300 m at 800 Hz) | |
| $k_1$ | ≤ 400 |
| $k_{9\text{-}12}$ neighbouring/next to neighbouring | ≤ 300/100 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

Integrated monitoring cores from 5x4 on

## Application

Signalling cable, optimised for installation, transversally water-tight, flame-retardant for railway control centres and surveillance systems, etc., suitable for installation in open air, in the ground, in cable tray channels, and for laying in tunnels and buildings.

The cable is halogen-free, flame-retardant, and with low smoke density, and therefore suitable for installation in areas with special hazards caused by fire propagation.

VDE approved and system-tested sleeves and conduits are available for this cable.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **H** | conductor insulation, halogen-free |
| **(L)H** | inner sheath, halogene-free, with Al tape |
| **B** | armouring, 2 layers, steel tape 0.1 or 0.2 mm |
| **H** | outer sheath, halogen-free, frame-retardant |
| **S** | signalling cable |
| **Lg** | stranded in layers |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-H(L)HBH from 1x... to 30x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

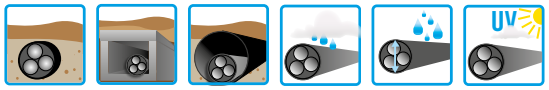
Edition: 05/2016

# BayRail® - Signalling cables

## A-2Y(L)2Y... - rail foot

Rail foot cable acc. to DB TL 416.0111


similar to the illustration




**Optional:**

## Standards

Technical specifications 416.0111,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | | | |
|---|---|---|---|
| Conductor cross-section mm² | 0,7 | 1,5 | 2,5 |
| Conductor resistance of the pair of cores Ω/km | ≤ 56,6 | ≤ 23,4 | ≤ 7,2 |
| Core resistance Ω/km | | | |
| Insulation resistance GΩxkm | ≥ 10 | ≥ 10 | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 45 | ≤ 45 | approx. 120 [1] |
| [1] applies to the single conductors ≤ 52 applies to 1x4x... | | | |
| **Alternating voltage test 50 Hz** | | | |
| Core-core Veff | 2500 | | |
| Core-screen Veff | 2500 | | |
| **Temperature ranges** | | | |
| During laying, installing °C | | | +5 to +25 |
| In the ground, pipe conduits and trough channels °C | | | -5 to +50 |
| Before and after laying, installing °C | | | -5 to +70 |

## Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated. The cables are preferred for laying along the rail foot at train speeds ≤ 160 km/h, but are also suitable for laying in the ground, in pipe conduits and trough channels.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | conductor insulation made of PE |
| **(L)2Y** | laminated sheath made of PE |
| **(L)2YV** | laminated sheath made of PE, reinforced |
| **B** | armouring made of band steel |
| **(SR)** | armouring made of steel channel binding |
| **2Y** | outer sheath made of PE |
| **(H45)** | maximum mutual capacitance value at 800 Hz, 45 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-2Y(L)2Y... from 1x... to 5x...

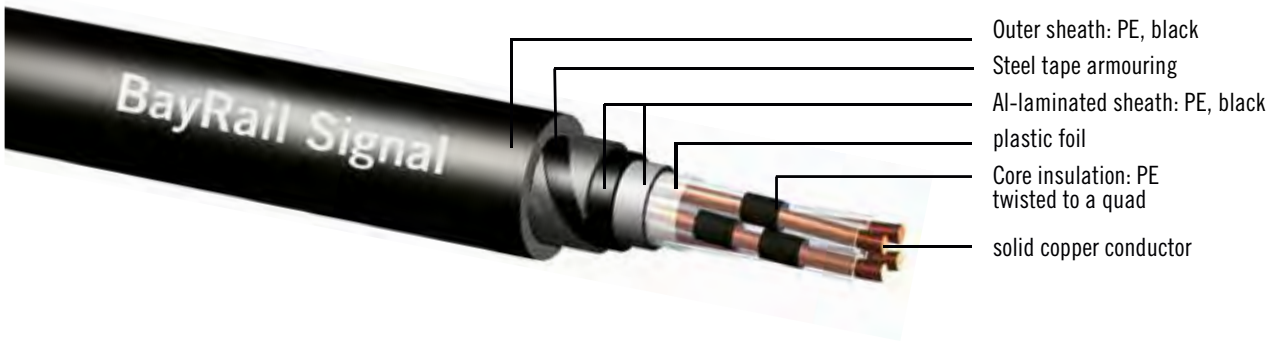
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Balise cables

## A-2Y(L)2YB2Y / AJ-2Y(L)2YDB2Y - Balise Cables

...x4x1,4 acc. to DB TL 416.0120




similar to the illustration


### Standards

Technical specifications 416.0120,
Bayka BayRail company standard:

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,4 |
| Conductor loop resistance Ω/km | ≤ 23,4 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 52 |
| Capacitive couplings at 800 Hz pF/500 m | |
| $K_1$ | ≤ 650 |
| ea1/2 | ≤ 1300 |
| **Characteristic impedance Ω** | |
| at 8.8 kHz | 147 ± 15 % |
| at 200 ... 600 kHz | 120 ± 10 % |
| **Wave attenuation dB/km** | |
| at 8.8 kHz | ≤ 2 |
| at 280 kHz | ≤ 5 |
| at 560 kHz | ≤ 7 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff / Core-screen Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -10 to +60 |
| Before and after laying, installing °C | -40 to +60 |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated. As balise cable for permanent laying in the ground or trough channels, or on cable holders in shaft and tunnel walls.
The balise cable is suitable:

- preferably for the transmission of alternating currents in systems requiring a high symmetry towards one another, against external interference and against earth potential.
- for the connection of an Euro balise and/or two Euro balises to an actuation unit (LEU) as cable distributor/Euro balise(s) - LEU connection

Designs:
Short distances up to 500 m A-2Y(L)2YB2Y 1x4x1.4

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **AJ** | outdoor cable with inductive protection |
| **2Y** | conductor insulation, sheath made from PE |
| **(L)2Y** | laminated sheath made of polyethylene |
| **D** | screen made of Cu wires |
| **B** | armouring |
| **2Y** | outer sheath made of PE |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

### Product range

- AJ-2Y(L)2YDB2Y 1x4x1,4

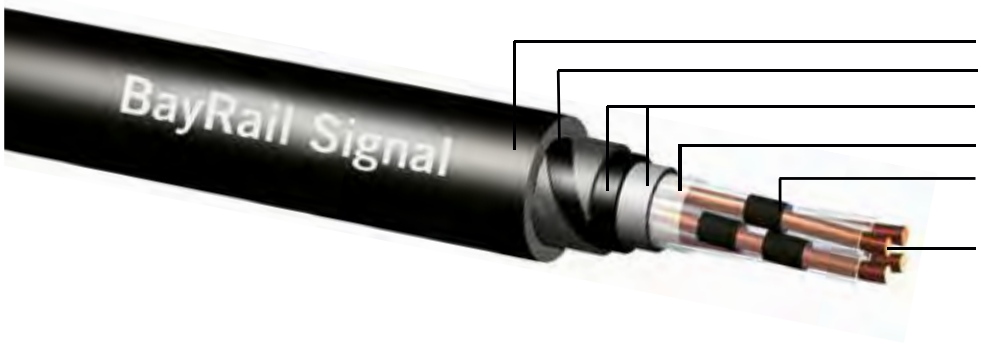
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Balise cables

## A-2Y(L)2YB2Y / AJ-2Y(L)2YDB2Y - Balise Cables

...x4x1,53 acc. to DB TL 416.0120




similar to the illustration


### Standards

Technical specifications 416.0120,
Bayka BayRail company standard:

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 1,53 |
| Conductor loop resistance Ω/km | ≤ 19,8 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 43 |
| Capacitive couplings at 800 Hz pF/500 m | |
| $K_1$ | ≤ 240 |
| ea1/2 | ≤ 650 |
| **Characteristic impedance Ω** | 147 ± 15 % |
| at 8.8 kHz | |
| at 200 ... 600 kHz | 120 ± 10 % |
| at 1.8 MHz | 120 ± 10 % |
| **Wave attenuation dB/km** | |
| at 8.8 kHz | ≤ 0.8 |
| at 280 kHz | ≤ 3 *) |
| at 560 kHz | ≤ 4.2 |
| at 1.8 MHz | ≤ 8 |

*) Attenuation at 280 kHz must not be smaller than the wave attenuation at 560 kHz by more than 1.8 dB/km

| | |
|---|---|
| **Alternating voltage test 50 Hz** | |
| Core-core Veff / Core-screen Veff | 2500 |
| **Temperature ranges** | -10 to +60 |
| During laying, installing °C | -40 to +60 |
| Before and after laying, installing °C | |

### Application

As a railway signalling cable, in railway control centres, surveillance systems and similar facilities, provided that the use of special signalling technology cables (e.g. PZB cables) is not stipulated. As balise cable for permanent laying in the ground or trough channels, or on cable holders in shaft and tunnel walls.

The balise cable is suitable:

- preferably for the transmission of alternating currents in systems requiring a high symmetry towards one another, against external interference and against earth potential.
- for the connection of an Euro balise and/or two Euro balises to an actuation unit (LEU) as cable distributor/Euro balise(s) - LEU connection

Designs:
Standard up to 2000 m A-2Y(L)2YB2Y 1x4x1.53

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **AJ** | outdoor cable with inductive protection |
| **2Y** | conductor insulation, sheath made from PE |
| **(L)2Y** | laminated sheath made of polyethylene |
| **D** | screen made of Cu wires |
| **B** | armouring |
| **2Y** | outer sheath made of PE |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request
- Flame retardant, non corrosive cables (FRNC, LSOH)

### Product range

- AJ-2Y(L)2YDB2Y 1x4x1,53

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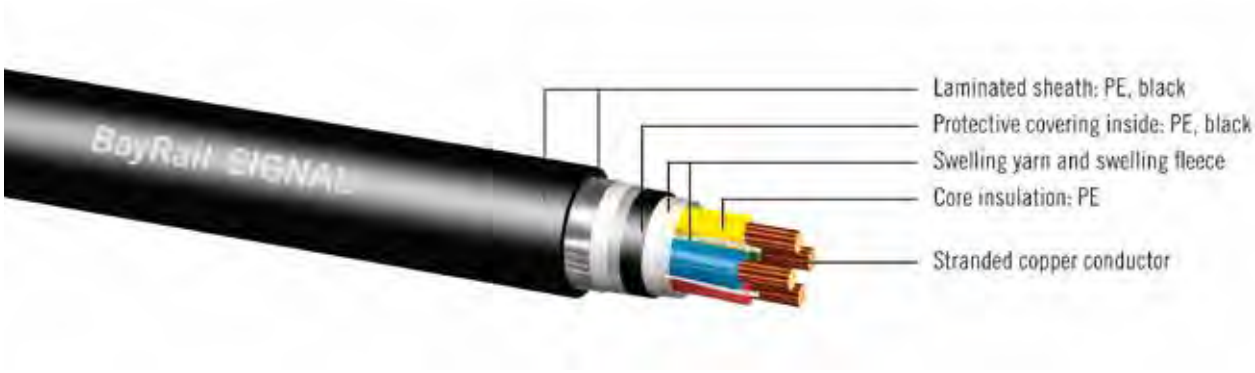
Edition: 05/2016

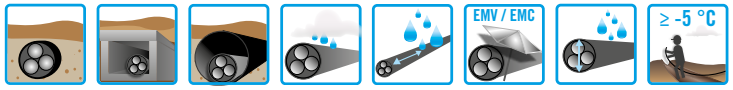
# BayRail® - Signalling cables

## A-2YTF(L)... / A-02YSTF(L)... - rail foot, permanent laying, connection cable

PZB Cable acc. to DB Dlk 1.013.168y, TL 416.0119, TL 416.0121




similar to the illustration




## Standards

Dlk 1.013.168y, TL 416.0119, TL 416.0121,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | | |
|---|---|---|
| Conductor cross-section mm²<br>A-2YTF2Y(L)2Y 1x4x0.75 mm²<br>A-2YTF(L)2YV 1x4x0.75 mm² | 0,75 | |
| Conductor diameter mm<br>A-02YSTF(L)2YB2Y/...(SR)2Y 1x4x0.8 | | 0,8 |
| Conductor resistance of the pair of cores Ω/km | ≥ 51,4 | ≥ 73,2 |
| Resistance difference Ω/km | ≤ 0.9 | ≤ 0.69 |
| Insulation resistance GΩxkm | ≥ 5 | ≥ 5 |
| Mutual capacitance at 800 Hz nF/km | ≤ 38 | ≤ 30 |
| **Alternating voltage test 50 Hz** | | |
| Core-core Veff | | 2500 |
| Core-screen Veff | | 2500 |
| **Temperature ranges** | | |
| During laying, installing °C | | -5 to +50 |
| Before and after laying, installing °C | | -30 to +70 |
| (PZB control cable to +80) | | |

## Application

PZB control cables according to Dlk 1.013.168y are used for controlling the track and switching magnets of the PZB. The cables are permitted for laying along the rail foot for train speeds ≤ 160 km/h.

PZB control cables according to TL 416.0119 are used for controlling the track and switching magnets of the PZB. Cables with solid conductors can be laid in the ground, in trough channels, in pipe conduits, and on cable holders in shaft and tunnel walls.

PZB connection cables according to TL 416.0121 are used for directly connecting the track and switching magnets, and/or the relay and switching units of the intermittent train running control (PZB track-side equipment).

The PZB cables must be used according to the effective maintenance guidelines.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | insulating cover made of polyethylene (PE) |
| **02YS** | conductor insulation made of foam skin |
| **TF** | C=cable dry filled with swelling yarns and swelling fleeces |
| **(L)2Y** | laminated sheath made of polyethylene |
| **(L)2YV** | laminated sheath made from polyethylene, reinforced |
| **B** | armouring made of band steel |
| **(SR)** | armouring made of steel channel binding |
| **2Y** | outer sheath made of PE |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

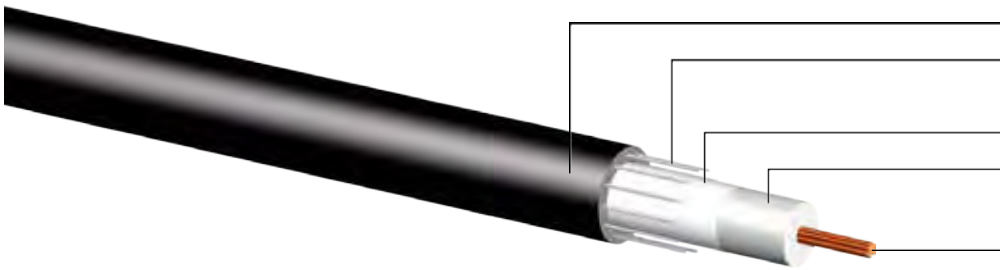
- PZB A-2YTF(L)... / A-02YSTF(L)... 1x...
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Line conductor cable

## A-2Y(ZG)2Y / A-H(ZG)H - Line conductor cables for the LZB system

LZB Line conductor cable acc. to DB TL 416.0101




similar to the illustration


**Optional:**


### Standards

Technical specifications 416.0101,
Bayka BayRail company standard.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 2 |
| Conductor resistance Ω/km | ≤ 9 |
| **Alternating voltage test 50 Hz** | |
| Core-core Veff | 2500 |
| **Temperature ranges** | |
| During laying, installing °C | -5 to +50 |
| Before and after laying, installing °C | -40 to +70 |

### Application

Line conductor cable for the LZB (continuous train control) system. The standard design, A-2Y(ZG)2Y, is for laying on free sections, and the flame-retardant FRNC design, A-H(ZG)H, is for laying in tunnels.

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **2Y** | conductor insulation made of polyethylene (PE) |
| **H** | conductor insulation made of halogen-free material |
| **(ZG)** | non-metallic stress relief elements in the PE sheath |
| **2Y** | outer sheath made of PE |
| **H** | outer sheath made of halogen-free material |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- Linienleiterkabel A-2Y(ZG)2Y 1x...

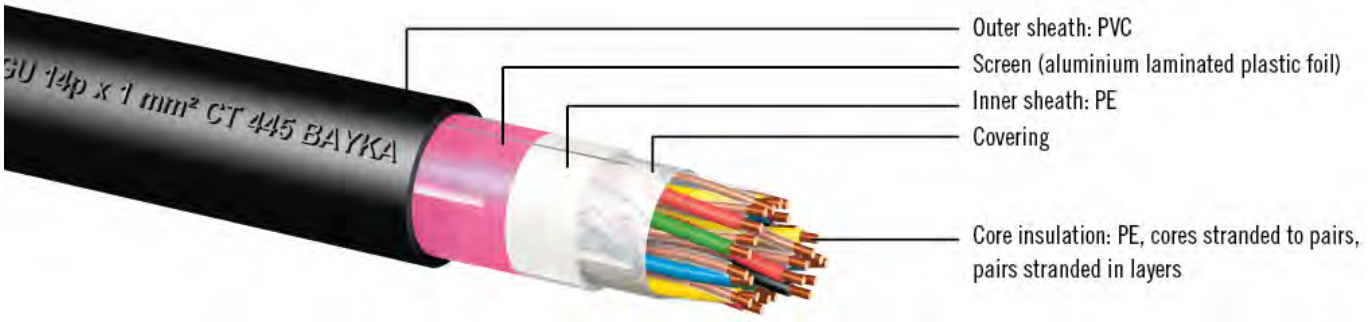
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## ZPGU - stranded pairs

...px1mm² acc. to SNCF CT 445




similar to the illustration

## Standards

SNCF CT 445

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor cross-section mm² | 1,0 |
| Conductor resistance Ω/km | ≤ 18,1 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance nF/km | ≤ 55 |

**Temperature ranges °C**

(acc. to DIN VDE0891, part06)

| | |
|---|---|
| in operation | ≤ 70 |
| when laying, installing °C | -20 to +50 |

## Application

Railway signalling cable, stranded pairs, in railway control centres and surveillance systems.

## Design

Cu-conductor solid 1mm²
Core insulation made of polyethylene (PE)
Cores stranded in pairs
Wrapping
Inner sheath made of polyethylene (PE)
Screen made of Al-coated plastic foil
Outer sheath made of PVC, black

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with improved electrical properties
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- ZPGU 14px1,0 qmm

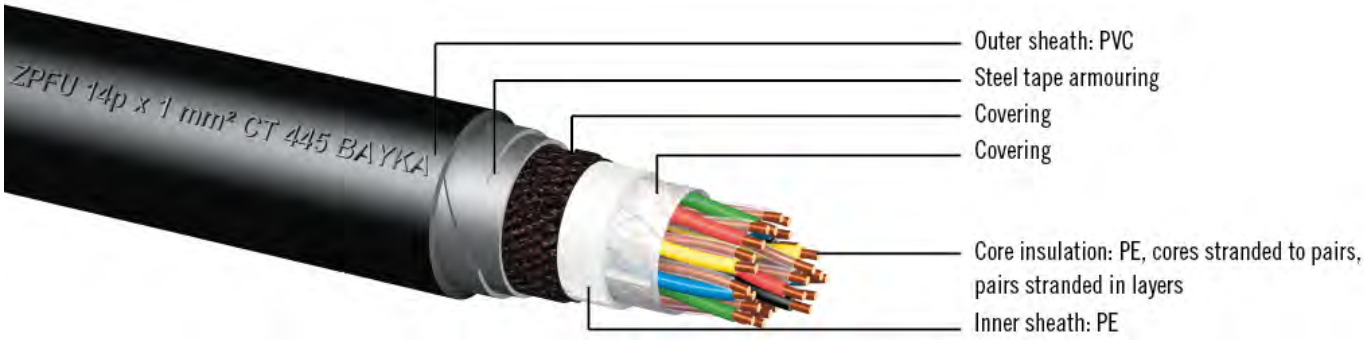
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## ZPFU - stranded pairs

...px1mm² acc. to SNCF CT 445




similar to the illustration


### Standards

SNCF CT 445

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor cross-section mm² | 1,0 |
| Conductor resistance Ω/km | ≤ 18,1 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance nF/km | ≤ 55 |
| **Temperature ranges °C** | |
| (acc. to DIN VDE0891, part06) | |
| in operation | ≤ 70 |
| when laying, installing °C | -20 to +50 |

### Application

Railway signalling cable with armouring (rodent protection), stranded pairs, in railway control centres and surveillance systems.

### Design

Cu-conductor solid 1mm²
Core insulation made of polyethylene (PE)
Cores stranded in pairs
Wrapping
Inner sheath made of polyethylene (PE)
Steel tape armouring
Outer sheath made of PVC, black

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with improved electrical properties
- Flame retardant, non corrosive cables (FRNC, LSOH)

### Product range

- ZPFU 14px 1mm2

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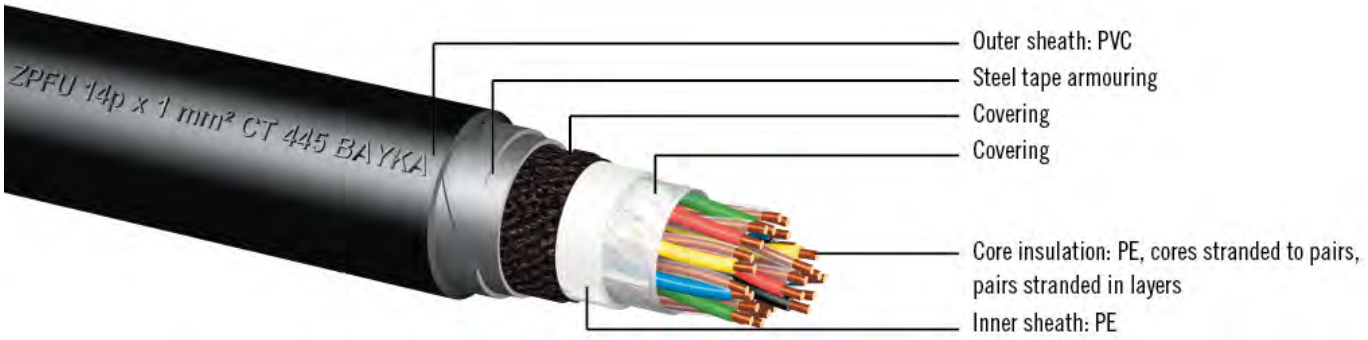
Edition: 05/2016

# BayRail® - Signalling cables

## ZPAU - stranded pairs

...px1mm² acc. to SNCF CT 445




similar to the illustration


## Standards

SNCF CT 445

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor cross-section mm² | 1,0 |
| Conductor resistance Ω/km | ≤ 18,1 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance nF/km | ≤ 55 |

**Temperature ranges °C**

(acc. to DIN VDE0891, part06)

| | |
|---|---|
| in operation | ≤ 70 |
| when laying, installing °C | -20 to +50 |

## Application

Railway signalling cable with low reduction factor, stranded pairs, in railway control centres and surveillance systems.

## Design

Cu-conductor solid 1mm²
Core insulation made of polyethylene (PE)
Cores stranded in pairs
Wrapping
Inner sheath made of polyethylene (PE)
Cu screen
Steel tape armouring
Outer sheath made of PVC, black

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with improved electrical properties
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- ZPAU from 4... to 14...

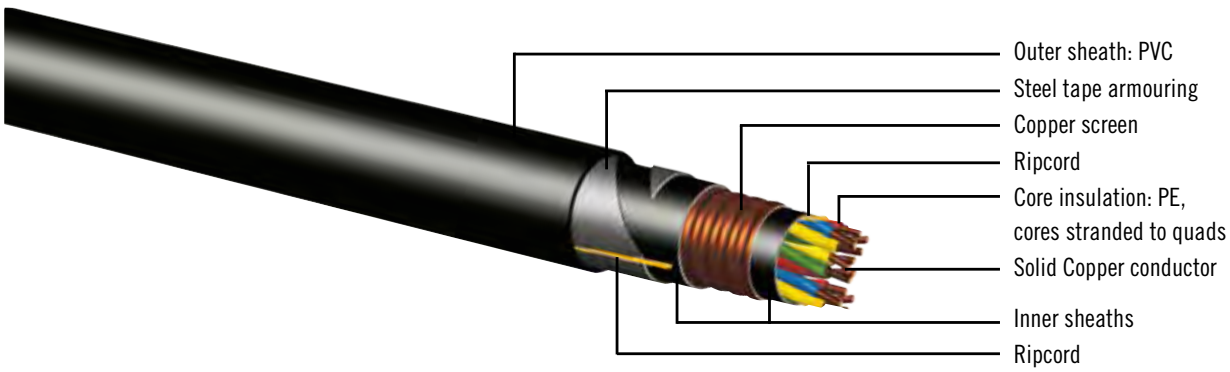
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

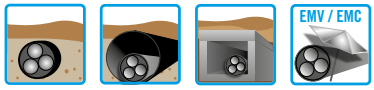
# BayRail® - Signalling cables

## ZCO3 - quad stranded

4qx1mm² (4qx1,13mm) acc. to SNCF CT 445




similar to the illustration



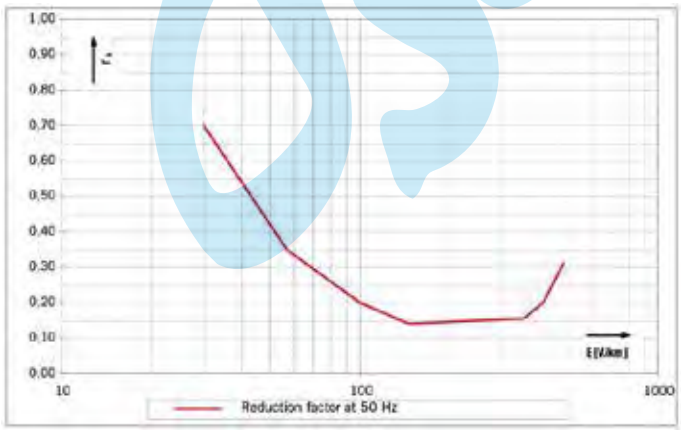

## Standards

SNCF CT 445

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 1.13 |
| Conductor cross-section mm² | 1.0 |
| Conductor resistance Ω/km | ≤ 18,1 |
| Insulation resistance GΩxkm | ≥ 5 |
| Mutual capacitance nF/km | ≤ 40 |
| Reduction factor at 50 Hz | see chart |




## Application

Railway signalling cable, quad stranded, induction-protected with low reduction factor, for railway control centres and surveillance systems in high speed railway networks.

## Design

Cu-conductor solid 1mm²
Core insulation made of polyethylene (PE)
Cores stranded in quads
Wrapping
1st inner sheath made of polyethylene (PE)
Screen made of corrugated copper tape, longitudinally applied
2nd inner sheath
Steel tape armouring
Outer sheath made of PVC, black

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with improved electrical properties
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- ZCO3 4qx1,0mm² (2B0,8)

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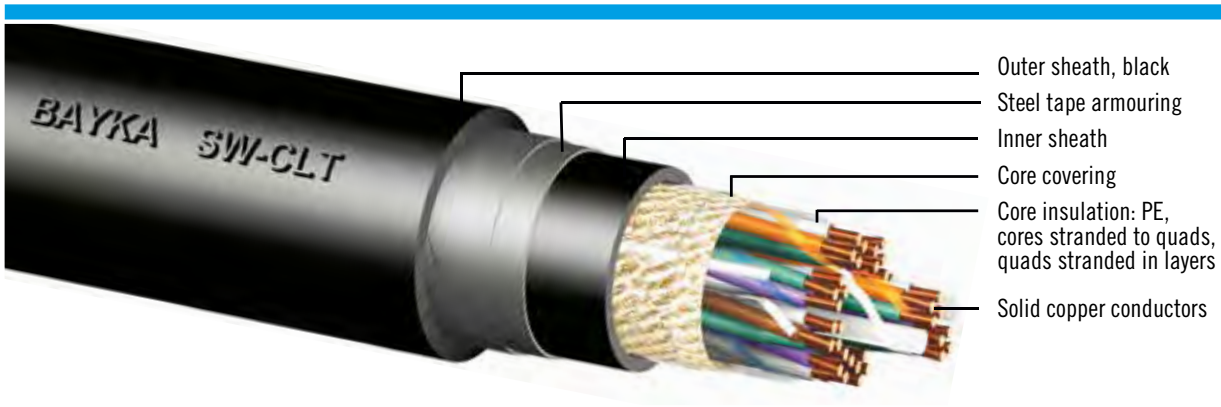
# BayRail® - Signalling cables

## SW-CLT - quad stranded, steel tape armouring

...x4x1,5 acc. to SBB (Swiss Federal Railways) 3001.82.1000




100% RoHS 100% REACH CE similar to the illustration


## Standards

Swiss Federal Railway SBB 3001.82.1000
halogen-free acc. to IEC 60754-1 and IEC 60754-2
smoke density acc. to IEC 61034-2

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm² | 1,5 |
| Conductor loop resistance Ω/km (DC at 20°C) | ≤ 20,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | 52 |
| **Capacitative couplings pF/300 m at 800 Hz** | |
| $k_1$ | ≤ 400 |
| $k_9$ ... $k_{12}$ | ≤ 400 |
| $ea_1$ ... $ea_2$ | ≤ 650 |
| **Operating voltage** | |
| AC Veff 16,7 Hz | 500 |
| DC V | 800 |
| **Alternating voltage test Veff** | |
| Core/core | 2000 |
| Core/armouring | 4000 |
| **Temperature ranges °C** when laying, installing °C | -10 to +50 |

| Quad | a-core | b-core | c-core | d-core |
|---|---|---|---|---|
| Pilot quad | white | orange | turquoise | violet |
| Direction quad | white | green | turquoise | violet |
| Standard quad 1 | white | white | turquoise | violet |
| Standard quad 2 | white | blue | turquoise | violet |

## Application

As railway signalling cable for railways, remote control, signalisation, control and safety signals.

## Design

Solid Cu-conductor
Conductor insulation made of PE
Cores stranded to quads
Quads stranded in layers
Inner sheath made of PE, black
Steel tape armouring (CL)
Outer sheath made of PE, black (T)

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with improved electrical properties
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- SW-CLT from 4... to 30...

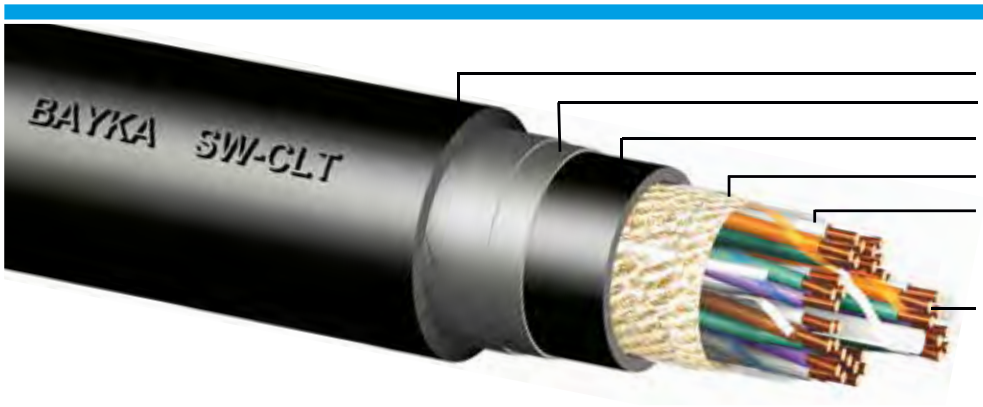
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## SW-CLT - quad stranded, steel tape armouring

...x4x2,2 acc. to SBB (Swiss Federal Railways) 3001.82.1000




100% RoHS 100% REACH CE similar to the illustration


## Standards

Swiss Federal Railway SBB 3001.82.1000
halogen-free acc. to IEC 60754-1 and IEC 60754-2
smoke density acc. to IEC 61034-2

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm² | 2,2 |
| Conductor loop resistance Ω/km (DC at 20°C) | ≤ 20,9 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | 60 |
| **Capacitative couplings pF/300 m at 800 Hz** | |
| $k_1$ | ≤ 400 |
| $k_9$ ... $k_{12}$ | ≤ 400 |
| $ea_1$ ... $ea_2$ | ≤ 650 |
| **Operating voltage** | |
| AC Veff 16,7 Hz | 500 |
| DC V | 800 |
| **Alternating voltage test Veff** | |
| Core/core | 2000 |
| Core/armouring | 4000 |
| **Temperature ranges °C** when laying, installing °C | -10 to +50 |

| Quad | a-core | b-core | c-core | d-core |
|---|---|---|---|---|
| Pilot quad | white | orange | turquoise | violet |
| Direction quad | white | green | turquoise | violet |
| Standard quad 1 | white | white | turquoise | violet |
| Standard quad 2 | white | blue | turquoise | violet |

## Application

As railway signalling cable for railways, remote control, signalisation, control and safety signals.

## Design

Solid Cu-conductor
Conductor insulation made of PE
Cores stranded to quads
Quads stranded in layers
Inner sheath made of PE, black
Steel tape armouring (CL)
Outer sheath made of PE, black (T)

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with improved electrical properties
- Flame retardant, non corrosive cables (FRNC, LSOH)

## Product range

- SW-CLT from 1... to 30...

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Edition: 05/2016

# BayRail® - Balise cables

## PE-ALT-CLT - quad stranded, steel tape armouring

...x4x1,53 acc. to SBB (Swiss Federal Railways) 3001.52.2000


100% RoHS 100% REACH CE similar to the illustration


## Standards

Swiss Federal Railway SBB 3001.52.2000
halogen-free acc. to IEC 60754-1 and IEC 60754-2
smoke density acc. to IEC 61034-2

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm² | 1,53 |
| Loop resistance (DC at 20° C) Ω/km | ≤ 19,8 |
| Insulation resistance GΩxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | 42.3 (±15 %) |
| **Capacitative couplings pF/300 m at 800 Hz** | |
| $k_1$ | ≤ 240 |
| $ea_1$ ... $ea_2$ | ≤ 650 |
| **Operating voltage** | |
| AC Veff / DC V | 420 / 600 |
| **Alternating voltage test Veff** | |
| core/core / core/Al tape | 2500 |
| **Impedance Ω** | |
| f=0.56 / 0.80 MHz | 120±10 % |
| f=1.80 MHz | 120±5 % |
| **Attenuation dB/100m** | |
| f=8.82 kHz | ≤ 0.08 |
| f=0.56 MHz | ≤ 0.40 |
| f=0.80 MHz | ≤ 0.50 |
| f=1.80 MHz | ≤ 0.80 |
| **Temperature range** | |
| during laying | -5 to +50 |
| during storage | -30 to +70 |
| Core marking | white/orange/turquoise/purple |

## Application

PE-insulation signalling cable as connection between ETCS balises and a Lineside Equipment Unit LEU for ERTMS (European Rail Traffic Management System).

## Design

Solid Cu-conductor
Conductor insulation made of PE
Cores stranded to quads
Quads stranded in layers
laminated sheath made of PE with aluminium foil, black (ALT)
Steel tape armouring (CL)
Outer sheath made of PE, black (T)

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- PE-ALT-CLT 1x4x1,53 mm

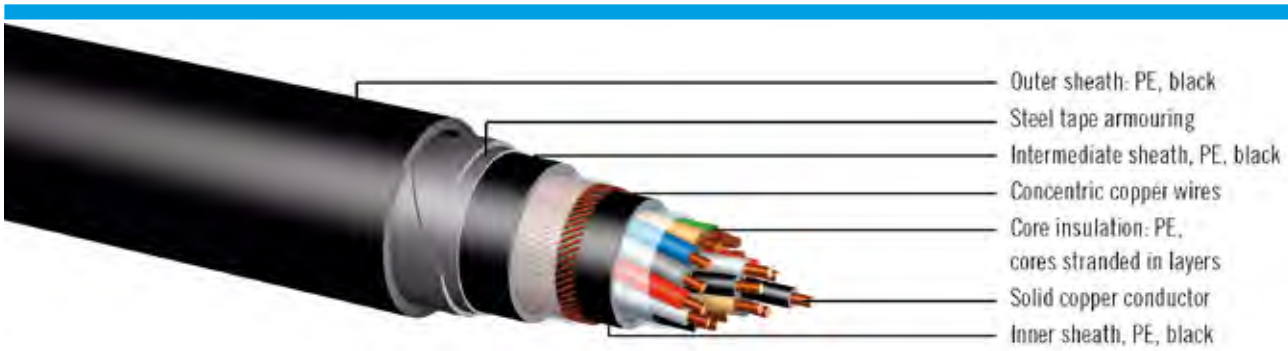
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## CCPSSP - stranded cores, steel tape armouring

CCPSSP-H acc. to E. T. 03.365.051.6 (RENFE / ADIF)




adif renfe 100% RoHS 100% REACH CE similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 1,4 |
| Conductor resistance (pair of cores) Ω/km | |
| Mean value | 11.2±0.5 |
| Maximum value | ≤ 11.9 |
| Insulation resistance MΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core-core Veff | 2100 |
| Core-screen Veff | 2500 |

### Application

Railway signalling cable, stranded cores, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...H** | number of the single conductors |
| **...mm** | conductor diameter |
| **CC** | screen made of copper wires or tapes |
| **P** | inner sheath made of PE |
| **SS** | armouring made of steel tapes |
| **P** | outer sheath made of PE |
| **FR** | reduction factor characteristic |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- CCPSSP-H from 4... to 61...

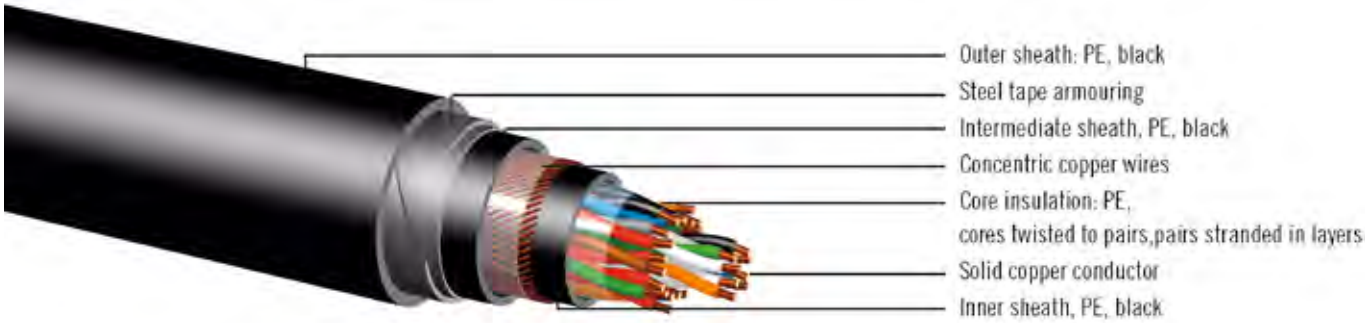
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## CCPSSP - cores twisted to pairs, pairs stranded in layers, steel tape armouring

CCPSSP-P acc. to E. T. 03.365.051.6 (RENFE / ADIF)




similar to the illustration


## Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm² | 0,9 |
| Conductor resistance Ω/km | |
| Mean value | 27.5±1.0 |
| Maximum value | ≤ 29.0 |
| Mutual capacitance at 1000±200 Hz nF/km | |
| Mean value | 52±4 |
| Maximum value | ≤ 58 |
| Capacitance difference at 1000±200 Hz pF/km | |
| Pair-pair mean value | 45 |
| Pair-pair maximum value | 260 |
| Pair-earth mean value | 650 |
| Pair-earth maximum value | 2625 |
| Attenuation at 1000 Hz dB/km | 12.8 |
| Insulation resistance MΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core-core Veff | 2100 |
| Core-screen Veff | 2500 |

## Application

As a railway signalling cable, in railway control centres and surveillance systems.

## Design

| | |
|---|---|
| **...P** | number of the pairs |
| **...mm** | conductor diameter |
| **CC** | screen made of copper wires or tapes |
| **P** | inner sheath made of PE |
| **SS** | armouring made of steel tapes |
| **P** | outer sheath made of PE |
| **FR** | reduction factor characteristic |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications

## Product range

- ...P 0,9mm CCPSSP from 7... to 50...

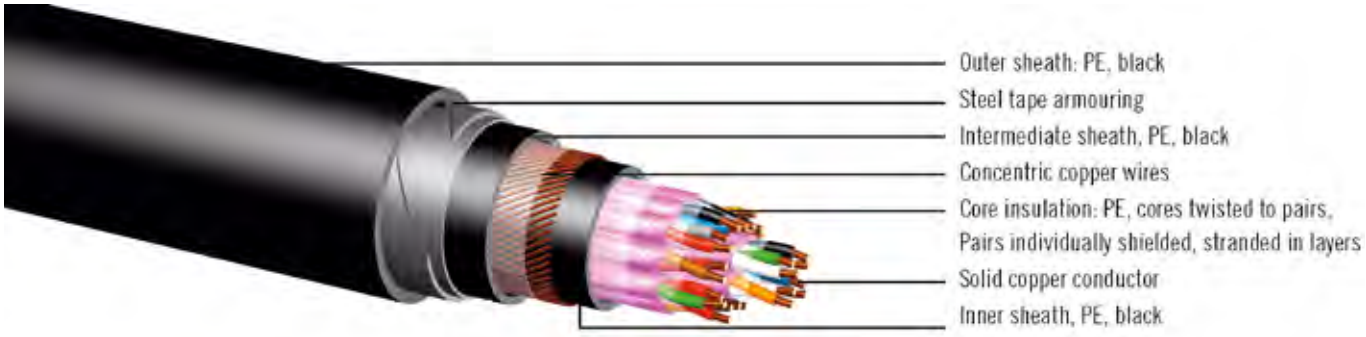
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## CCPSSP - cores twisted to pairs, pairs shielded, stranded in layers, steel tape armouring

CCPSSP-PI acc. to E. T. 03.365.051.6 (RENFE / ADIF)

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### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 1,4 |
| Conductor resistance Ω/km | |
| Mean value | 11.2±0.5 |
| Maximum value | ≤ 11.9 |
| Mutual capacitance at 1000±200 Hz nF/km | |
| Mean value | 59±3 |
| Maximum value | ≤ 65 |
| Near-end crosstalk attenuation dB at 10 kHz | ≥ 75 |
| Far-end crosstalk attenuation dB at 10 kHz | ≥ 65 |
| Insulation resistance MΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core/core | 4500 |
| Core/screen | 1500 |

### Application

As a railway signalling cable, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...PI** | number of the pairs in foil |
| **...mm** | conductor diameter |
| **CC** | screen made of copper wires or tapes |
| **P** | inner sheath made of PE |
| **SS** | armouring made of steel tapes |
| **P** | outer sheath made of PE |
| **FR** | reduction factor characteristic |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...PI 0,9mm CCPSSP from 2... to 28...

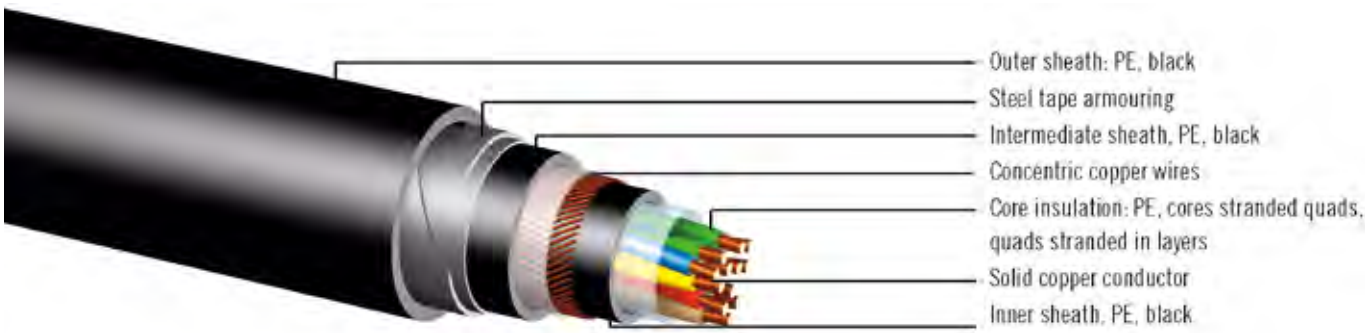
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## CCPSSP - cores stranded quads, quads stranded in layers, steel tape armouring

CCPSSP-X acc. to E. T. 03.365.051.6 (RENFE / ADIF)




similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | | |
|---|---|---|
| Conductor diameter mm² | 0,9 | 1,4 |
| Conductor resistance Ω/km | | |
| Mean value | 27.5±1 | 11.2±0.5 |
| Maximum value | ≤ 29.0 | ≤ 11.9 |
| Mutual capacitance at 1000±200 Hz nF/km | | |
| Mean value | 38±3 | 41±4 |
| Maximum value | ≤ 45 | ≤ 48 |
| Capacitance difference at 1000±200 Hz pF/km | | |
| Pair-pair mean value | 35 | 35 |
| Pair-pair maximum value | 250 | 250 |
| Pair-earth mean value | 320 | 320 |
| Pair-earth maximum value | 1200 | 1200 |
| Attenuation at 1000 Hz dB/km | 0,7 | 0,46 |
| Insulation resistance at 1000 Hz MΩ/km | ≥ 35000 | ≥ 35000 |
| 50 Hz alternating voltage test | | |
| Core-core Veff | 2100 | 2100 |
| Core-screen Veff | 2500 | 2500 |

### Application

As a railway signalling cable, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...X** | number of the quads |
| **...mm** | conductor diameter |
| **CC** | screen made of copper wires or tapes |
| **P** | inner sheath made of PE |
| **SS** | armouring made of steel tapes |
| **P** | outer sheath made of PE |
| **FR** | reduction factor characteristic |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...X 1,4mm CCPSSP from 1... to 48...

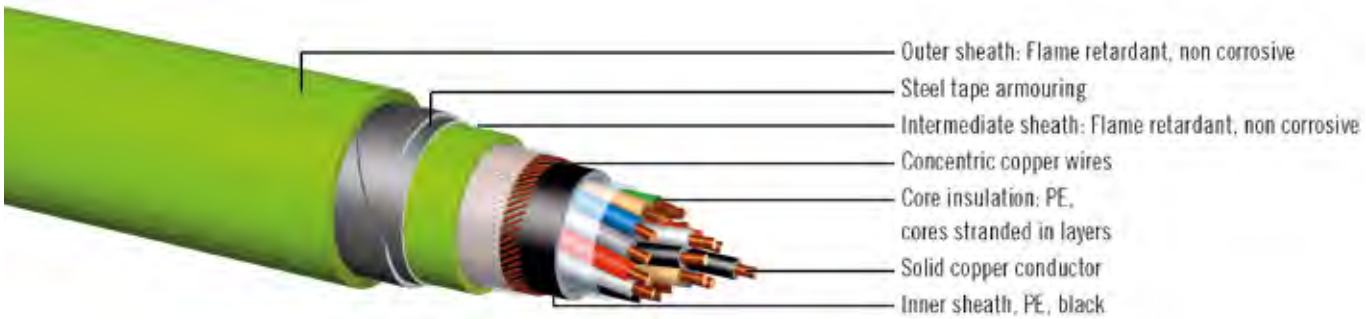
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## CCTSST - cores stranded in layers, steel tape armouring, flame retardant, non corrosive

CCTSST-H acc. to E. T. 03.365.051.6 (RENFE / ADIF)




adif renfe 100% RoHS 100% REACH CE similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 1,4 |
| Conductor resistance (pair of cores) Ω/km | 11.2±0.5 |
| Mean value | ≤ 11.9 |
| Maximum value | |
| Insulation resistance MΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core-core Veff | 2100 |
| Core-screen Veff | 2500 |

### Application

Railway signalling cable, stranded cores, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...H** | number of single conductors |
| **...mm** | conductor diameter |
| **CC** | screen made of copper wires or tapes |
| **T** | inner sheath made of halogen-free, flame retardant copolymer |
| **SS** | armouring made of steel tapes |
| **T** | outer sheath made of halogen-free, flame retardant copolymer |
| **FR** | reduction factor characteristic |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...H 1,4mm CCTSST from 4... to 61...

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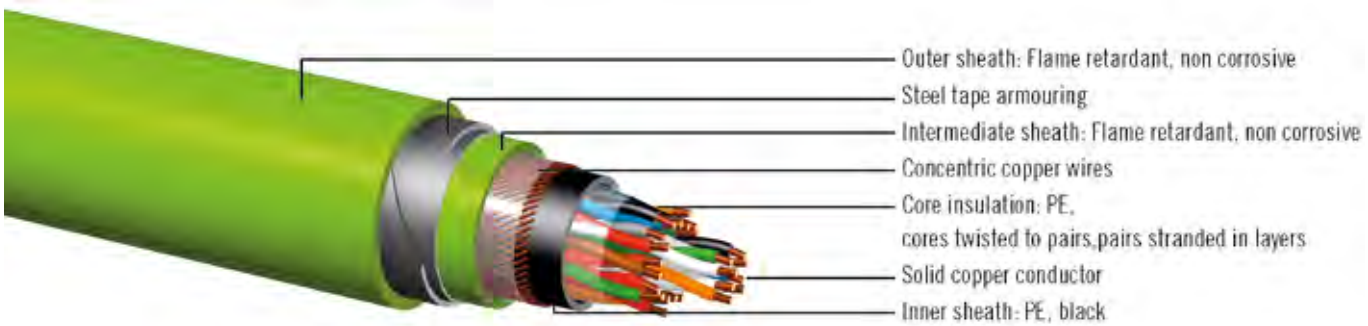
Edition: 05/2016

# BayRail® - Signalling cables

## CCTSST - cores twisted to pairs, steel tape armouring, flame retardant, non corrosive

CCTSST-P acc. to E. T. 03.365.051.6 (RENFE / ADIF)




adif renfe 100% RoHS 100% REACH CE similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 0,9 |
| Conductor resistance Ω/km | |
| Mean value | 27.5±1.0 |
| Maximum value | ≤ 29.0 |
| Mutual capacitance at 1000±200 Hz nF/km | |
| Mean value | 52±4 |
| Maximum value | ≤ 58 |
| Capacitance difference at 1000±200 Hz pF/km | |
| Pair-pair mean value | 45 |
| Pair-pair maximum value | 260 |
| Pair-earth mean value | 650 |
| Pair-earth maximum value | 2625 |
| Attenuation at 1000Hz dB/km | 12,8 |
| Insulation resistance MΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core-core Veff | 2100 |
| Core-screen Veff | 2500 |

### Application

As a railway signalling cable, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...P** | number of the pairs |
| **...mm** | conductor diameter |
| **CC** | screen made of copper wires or tapes |
| **T** | inner sheath made of halogen-free, flame retardant copolymer |
| **SS** | armouring made of steel tapes |
| **T** | outer sheath made of halogen-free, flame retardant copolymer |
| **FR** | reduction factor characteristic |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...P 0,9mm CCTSST

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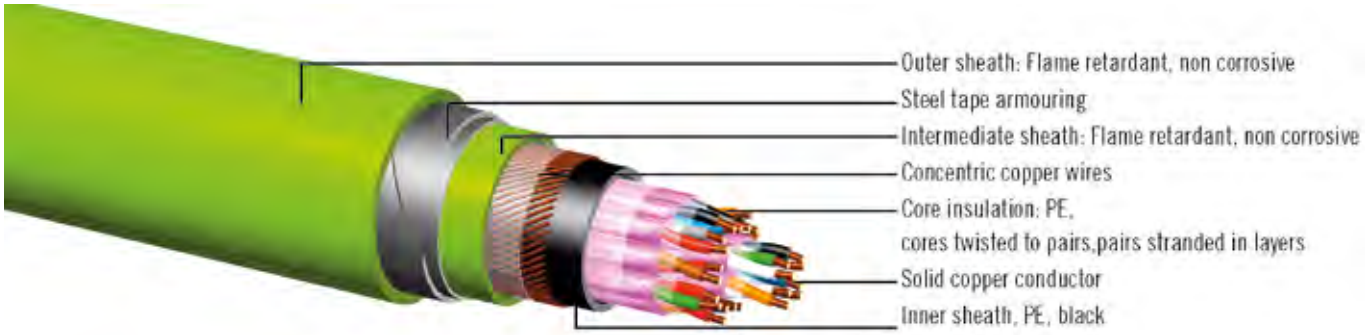
Edition: 05/2016

# BayRail® - Signalling cables

## CCTSST - cores twisted to pairs, steel tape armouring, flame retardant, non corrosive

CCTSST-PI acc. to E. T. 03.365.051.6 (RENFE / ADIF)




adif renfe 100% RoHS 100% REACH CE similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 1,4 |
| Conductor resistance Ω/km | |
| Mean value | 11.2±0.5 |
| Maximum value | ≤ 11.9 |
| Mutual capacitance at 1000±200 Hz nF/km | |
| Mean value | 59±3 |
| Maximum value | ≤ 65 |
| Near-end crosstalk attenuation dB | |
| at 10 kHz | ≥ 75 |
| Far-end crosstalk attenuation dB | |
| at 10 kHz | ≥ 65 |
| Insulation resistance MΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core-core Veff 2,500 | 4500 |
| Core-screen Veff | 1500 |

### Application

As a railway signalling cable, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...PI** | number of pairs in foil |
| **...mm** | conductor diameter |
| **CC** | screen made of copper wires or tapes |
| **T** | inner sheath made of halogen-free, flame retardant copolymer |
| **SS** | armouring made of steel tapes |
| **T** | outer sheath made of halogen-free, flame retardant copolymer |
| **FR** | reduction factor characteristic |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...PI 0,9mm CCTSST from 6... to 14...

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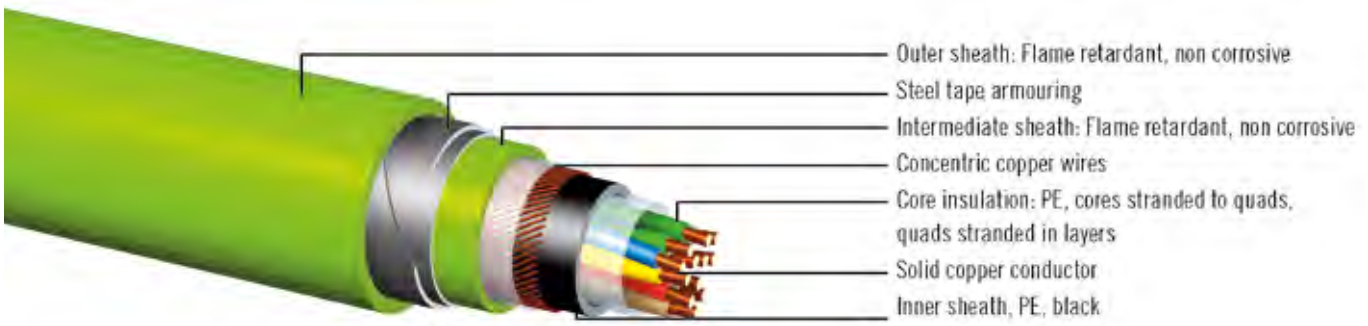
Edition: 05/2016

# BayRail® - Signalling cables

## CCTSST - cores stranded to quads, steel tape armouring, flame retardant, non corrosive

CCTSST-X acc. to E. T. 03.365.051.6 (RENFE / ADIF)

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### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | | |
|---|---|---|
| Conductor diameter mm² | 0,9 | 1,4 |
| Conductor resistance Ω/km | | |
| Mean value | 27.5±1 | 11.2±0.5 |
| Maximum value | ≤29.0 | ≤11.9 |
| Mutual capacitance at 1000±200 Hz nF/km | 38±3 | 41±4 |
| Mean value | ≤45 | ≤48 |
| Maximum value | | |
| Capacitance difference at 1000±200 Hz pF/km | | |
| Pair-pair mean value | 35 | 35 |
| Pair-pair maximum value | 250 | 250 |
| Pair-earth mean value | 320 | 320 |
| Pair-earth maximum value | 1200 | 1200 |
| Attenuation at 1000 Hz dB/km | 0.7 | 0.46 |
| Insulation resistance at 1000 Hz MΩ/km | ≥35000 | ≥35000 |
| 50 Hz alternating voltage test | | |
| Core-core Veff | 2100 | 2100 |
| Core-screen Veff | 2500 | 2500 |

### Application

As a railway signalling cable, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...X** | number of the quads |
| **...mm** | conductor diameter |
| **CC** | screen made of copper wires or tapes |
| **T** | inner sheath made of halogen-free, flame retardant copolymer |
| **SS** | armouring made of steel tapes |
| **T** | outer sheath made of halogen-free, flame retardant copolymer |
| **FR** | reduction factor characteristic |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...X 0,9mm CCTSST

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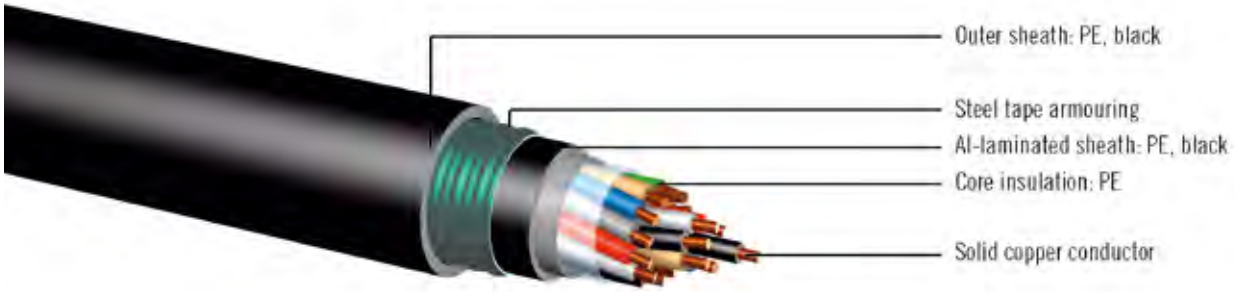
Edition: 05/2016

# BayRail® - Signalling cables

## EAPSP - single conductors, Al-laminated inner sheath, steel tape armouring

EAPSP-H acc. to E. T. 03.365.051.6 (RENFE / ADIF)




similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 1,4 |
| Conductor resistance Ω/km | |
| Mean value | 11.2±0.5 |
| Maximum value | ≤ 11.9 |
| Insulation resistance GΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core/core | 2100 |
| Core/screen | 2500 |

### Application

Railway signalling cable, stranded cores, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...H** | number of the single conductors |
| **...mm** | conductor diameter |
| **EA** | Al tape |
| **P** | inner sheath made of PE |
| **S** | armouring made of steel tape |
| **P** | outer sheath made of PE |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...H 1,4mm EAPSP from 4... to 48...

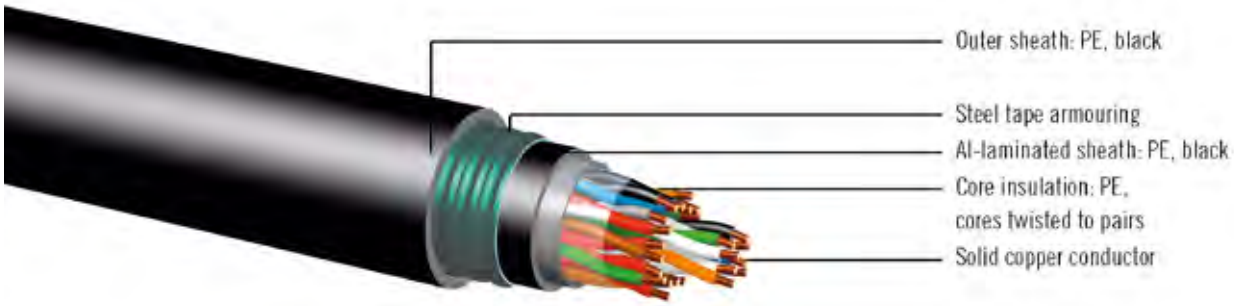
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## EAPSP - cores twisted to pairs, Al-laminated inner sheath, steel tape armouring

EAPSP-P acc. to E. T. 03.365.051.6 (RENFE / ADIF)




similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 0,9 |
| Conductor resistance Ω/km | |
| Mean value | 27.5±1.0 |
| Maximum value | ≤ 29.0 |
| Mutual capacitance at 1000±200Hz nF/km | |
| Mean value | 52±4 |
| Maximum value | ≤ 58 |
| Capacitance difference at 1000±200 Hz pF/km | |
| Pair-pair mean value | 45 |
| Pair-pair maximum value | 260 |
| Pair-earth mean value | 650 |
| Pair-earth maximum value | 2625 |
| Attenuation at 1000Hz dB/km | < 12,8 |
| Insulation resistance MΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core/core | 2100 |
| Core/screen | 2500 |

### Application

As a railway signalling cable, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...P** | number of the pairs |
| **...mm** | conductor diameter |
| **P** | inner sheath made of PE |
| **S** | armouring made of steeltape |
| **P** | outer sheath made of PE |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...P 0,9mm EAPSP

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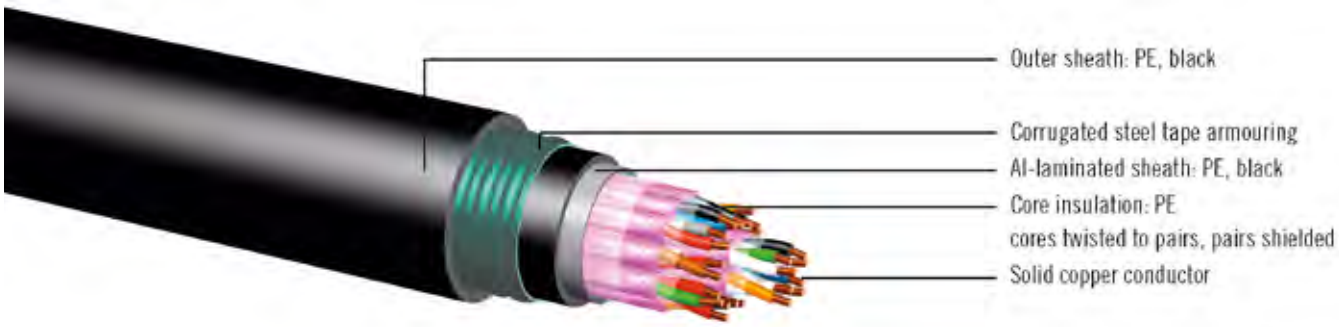
Edition: 05/2016

# BayRail® - Signalling cables

## EAPSP - cores twisted to pairs, Al-laminated inner sheath, steel tape armouring

EAPSP-PI acc. to E. T. 03.365.051.6 (RENFE / ADIF)




adif renfe 100% RoHS 100% REACH CE similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 1,4 |
| Conductor resistance Ω/km | |
| Mean value | 11.2±0.5 |
| Maximum value | ≤ 11.9 |
| Mutual capacitance at 1000±200 Hz nF/km | |
| Mean value | 59±3 |
| Maximum value | ≤ 65 |
| Near-end crosstalk attenuation dB at 10 kHz | ≥ 75 |
| Far-end crosstalk attenuation dB at 10 kHz | ≥ 65 |
| Insulation resistance MΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core/core | 4500 |
| Core/screen | 1500 |

### Application

As a railway signalling cable, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...PI** | number of the shielded pairs |
| **...mm** | conductor diameter |
| **EA** | Al tape |
| **P** | inner sheath made of PE |
| **S** | armouring made of steeltape |
| **P** | outer sheath made of PE |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...PI 0,9mm EAPSP from 3... to 20...

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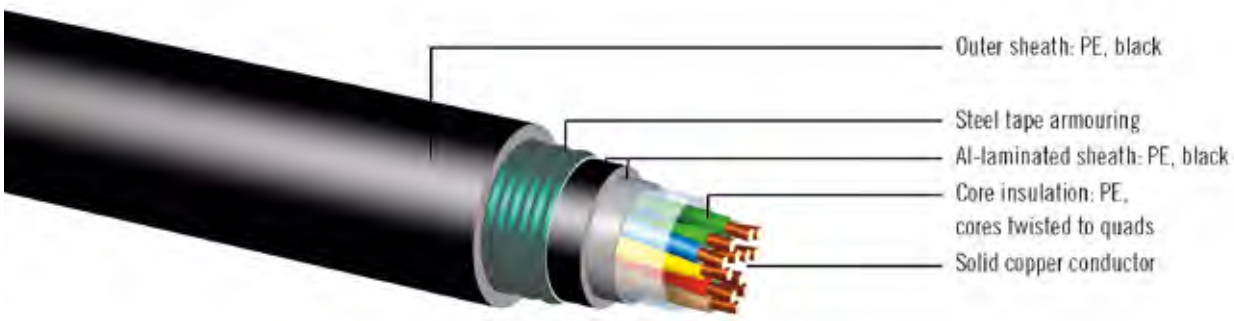
Edition: 05/2016

# BayRail® - Signalling cables

## EAPSP - cores twisted to pairs, Al-laminated inner sheath, steel tape armouring

EAPSP-X acc. to E. T. 03.365.051.6 (RENFE / ADIF)




similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | | |
|---|---|---|
| Conductor diameter mm² | 0,9 | 1,4 |
| Conductor resistance Ω/km | | |
| Mean value | 27.5±1 | 11.2±0.5 |
| Maximum value | ≤ 29.0 | ≤ 11.9 |
| Mutual capacitance at 1000±200 Hz nF/km | | |
| Mean value | 38±3 | 41±4 |
| Maximum value | ≤ 45 | ≤ 48 |
| Capacitance difference at 1000±200 Hz pF/km | | |
| Pair-pair mean value | 35 | 35 |
| Pair-pair maximum value | 250 | 250 |
| Pair-earth mean value | 320 | 320 |
| Pair-earth maximum value | 1200 | 1200 |
| Attenuation at 1000 Hz dB/km | 0.7 | 0.46 |
| Insulation resistance at 1000 Hz MΩxkm | ≥ 35000 | ≥ 35000 |
| 50 Hz alternating voltage test | | |
| Core/core | 2100 | 2100 |
| Core/screen | 2500 | 2500 |

### Application

As a railway signalling cable, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...X** | number of the quads |
| **...mm** | conductor diameter |
| **EA** | Al tape |
| **P** | inner sheath made of PE |
| **S** | armouring made of steeltape |
| **P** | outer sheath made of PE |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...X 0,9mm EAPSP from 1... to 27...

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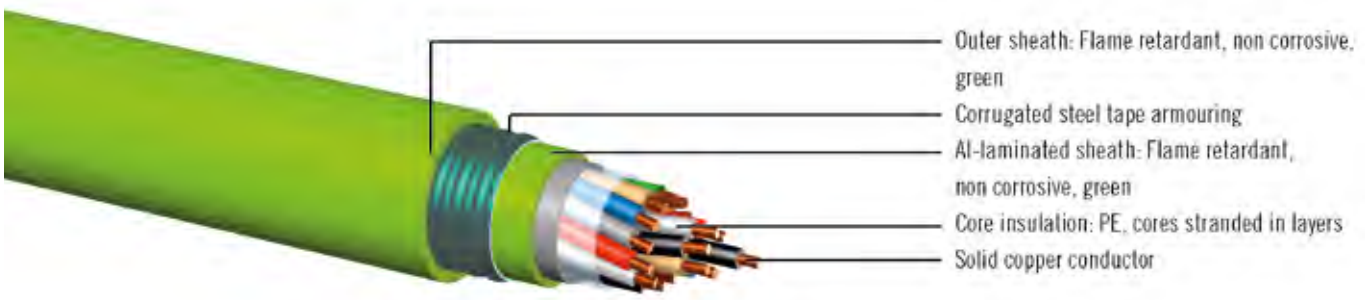
Edition: 05/2016

# BayRail® - Signalling cables

## EATST - Al-laminated inner sheath, steel tape armouring, Flame retardant, non corrosive

EATST-H acc. to E. T. 03.365.051.6 (RENFE / ADIF)




similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 1,4 |
| Conductor resistance Ω/km | |
| Mean value | 11.2±0.5 |
| Maximum value | ≤ 11.9 |
| Insulation resistance at 1000 Hz MΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core/core | 2100 |
| Core/screen | 2500 |

### Application

Railway signalling cable, stranded cores, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...H** | number of the single conductors |
| **...mm** | conductor diameter |
| **EA** | Al tape |
| **T** | inner sheath made of halogen-free, flame retardant copolymer |
| **S** | armouring made of steel tape |
| **T** | outer sheath made of halogen-free, flame retardant copolymer |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...H 1,4mm EAPSP from 4... to 75...

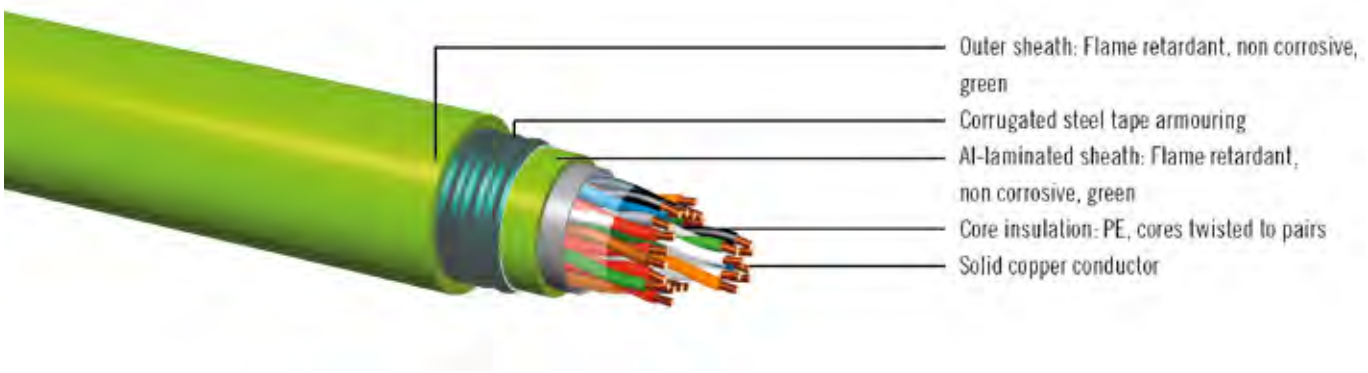
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## EATST - cores twisted to pairs, Al-laminated inner sheath, steel tape armouring

EATST-P acc. to E. T. 03.365.051.6 (RENFE / ADIF)




similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 0,9 |
| Conductor resistance Ω/km | |
| Mean value | 27.5±1.0 |
| Maximum value | ≤ 29.0 |
| Mutual capacitance at 1000±200 Hz nF/km | |
| Mean value | 52±4 |
| Maximum value | ≤ 58 |
| Capacitance difference at 1000±200 Hz pF/km | |
| Pair-pair mean value | 45 |
| Pair-pair maximum value | 260 |
| Pair-earth mean value | 650 |
| Pair-earth maximum value | 2625 |
| Attenuation at 1000 Hz dB/km | 12.8 |
| Insulation resistance MΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core/core | 2100 |
| Core/screen | 2500 |

### Application

As a railway signalling cable, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...P** | number of the pairs |
| **...mm** | conductor diameter |
| **T** | inner sheath made of halogen-free, flame retardant copolymer |
| **S** | armouring made of steel tape |
| **T** | outer sheath made of halogen-free, flame retardant copolymer |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...P 0,9mm EAPSP

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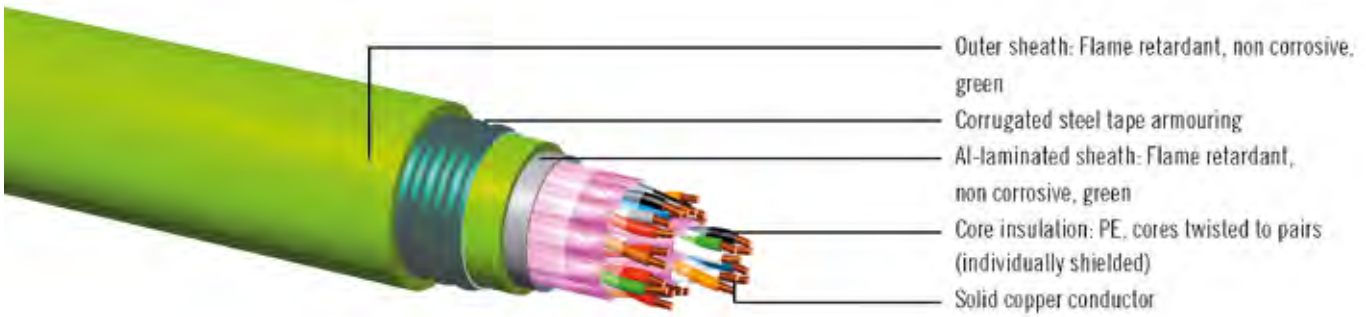
Edition: 05/2016

# BayRail® - Signalling cables

## EATST - Al-laminated inner sheath, steel tape armouring, Flame retardant, non corrosive

EATST-PI acc. to E. T. 03.365.051.6 (RENFE / ADIF)

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### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm² | 1,4 |
| Conductor resistance Ω/km | |
| Mean value | 11.2±0.5 |
| Maximum value | ≤ 11.9 |
| Mutual capacitance at 1000±200 Hz nF/km | |
| Mean value | 59±3 |
| Maximum value | ≤ 65 |
| Near-end crosstalk attenuation dB at 10 kHz | ≥ 75 |
| Far-end crosstalk attenuation dB at 10 kHz | ≥ 65 |
| Insulation resistance MΩxkm | ≥ 35000 |
| 50 Hz alternating voltage test | |
| Core/core | 4500 |
| Core/screen | 1500 |

### Application

As a railway signalling cable, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...PI** | number of the shielded pairs |
| **...mm** | conductor diameter |
| **EA** | Al tape |
| **T** | inner sheath made of halogen-free, flame retardant copolymer |
| **S** | armouring made of steel tape |
| **T** | outer sheath made of halogen-free, flame retardant copolymer |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...PI 0,9mm EATST

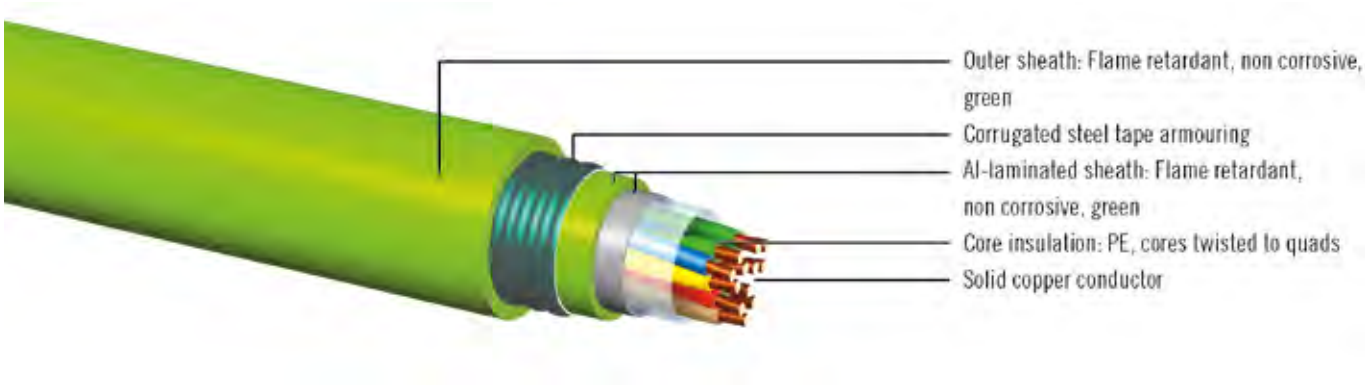
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayRail® - Signalling cables

## EATST - cores twisted to pairs, Al-laminated inner sheath, steel tape armouring

EATST-X acc. to E. T. 03.365.051.6 (RENFE / ADIF)




similar to the illustration


### Standards

adif E.T. 03.365.051.6

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | | |
|---|---|---|
| Conductor diameter mm² | 0,9 | 1,4 |
| Conductor resistance Ω/km | | |
| Mean value | 27.5±1 | 11.2±0.5 |
| Maximum value | ≤ 29.0 | ≤ 11.9 |
| Mutual capacitance at 1000±200 Hz nF/km | | |
| Mean value | 38±3 | 41±4 |
| Maximum value | ≤ 45 | ≤ 48 |
| Capacitance difference at 1000±200 Hz pF/km | | |
| Pair-pair mean value | 35 | 35 |
| Pair-pair maximum value | 250 | 250 |
| Pair-earth mean value | 320 | 320 |
| Pair-earth maximum value | 1200 | 1200 |
| Attenuation at 1000 Hz dB/km | 0.7 | 0.46 |
| Insulation resistance at 1000 Hz MΩxkm | ≥ 35000 | ≥ 35000 |
| 50 Hz alternating voltage test | | |
| Core/core | 2100 | 2100 |
| Core/screen | 2500 | 2500 |

### Application

As a railway signalling cable, in railway control centres and surveillance systems.

### Design

| | |
|---|---|
| **...X** | number of the quads |
| **...mm** | conductor diameter |
| **EA** | Al tape |
| **T** | inner sheath made of halogen-free, flame retardant copolymer |
| **S** | armouring made of steel tape |
| **T** | outer sheath made of halogen-free, flame retardant copolymer |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications

### Product range

- ...X 0,9mm EAPSP

- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# Telecommunication

BayCom®

## Telecommunication cables



BayCom®

## Telecommunication cables - rail foot



BayCom®

## Telecommunication cables - aerial cable



BayCom®

## Telecommunication cables - Fibre Optic (FOC)



BayCom®

## Telecommunication cables - FO aerial cable



BayCom®

## Telecommunication cables - FO indoor cable



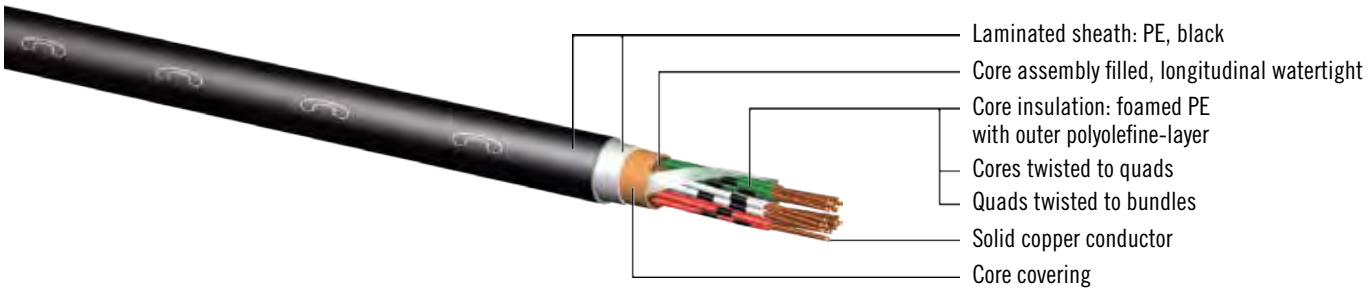
RailOptic®

## Telecommunication cables - FO RailOptic®

# BayCom® - Railway telecommunication cables

## A-02YSF(L)2Y ... StIII - cores twisted to quads, Al-laminated sheath

...x2x0,6 acc. to DB Dlk 1.013.151y




similar to the illustration


### Standards

Dlk 1.013.151y and/or DIN VDE 0816-part 1.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,6 |
| Conductor resistance (pair of cores) Ω/km | ≤130 |
| Resistance difference Ω/km | ≥ 5 |
| Mutual capacitance at 800Hz nF/km | ≤ 42 |
| Capacitive couplings pF/km at 800 Hz | |
| k1 (98%/100% of all values) | ≤ 1333/2666 |
| k9-12 (98%/100% of all values) | ≤ 333/1000 |
| Operating voltage V | ≤ 225 |
| Alternating voltage test 50 Hz | |
| core-core Veff | 500 |
| core-screen Veff | 2000 |
| Temperature ranges | |
| during laying, installing °C | -20 to +50 |
| before and after laying, installing °C | -40 to +70 |

### Application

As connection cable in subscriber networks and private branch exchanges, for telephony and data transmission. Suitable for laying in the ground and in cable ducts, as well as for threading into cable conduits. The cables are approved by VDE (certificate with production monitoring) and released for use in the area of operation of Deutsche Bahn AG.

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **02YS** | conductor insulation made from cell PE with outer polyolefin layer |
| **F** | cable core filled with petroleum jelly, longitudinally watertight |
| **(L)2Y** | laminated sheath, transversally watertight |
| **St III** | starquad in the local cable |
| **Bd** | stranded in bundles |
| **(H42)** | Mutual capacitance max value 42 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- A-02YSF(L)2Y from 6x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:



Edition: 05/2016

# BayCom® - Railway telecommunication cables

## A-02YSF(L)2Y ... StIII - cores twisted to quads, Al-laminated sheath

...x2x0,8 acc. to DB Dlk 1.013.151y


similar to the illustration


## Standards

Dlk 1.013.151y and/or DIN VDE 0816-part 1.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,8 |
| Conductor resistance (pair of cores) Ω/km | ≤73.2 |
| Resistance difference Ω/km | ≥ 5 |
| Mutual capacitance at 800Hz nF/km | ≤ 42 |
| Capacitive couplings pF/km at 800 Hz | |
| k1 (98%/100% of all values) | ≤ 1333/2666 |
| k9-12 (98%/100% of all values) | ≤ 333/1000 |
| Operating voltage V | ≤ 225 |
| Alternating voltage test 50 Hz | |
| core-core Veff | 500 |
| core-screen Veff | 2000 |
| Temperature ranges | |
| during laying, installing °C | -20 to +50 |
| before and after laying, installing °C | -40 to +70 |

## Application

As connection cable in subscriber networks and private branch exchanges, for telephony and data transmission. Suitable for laying in the ground and in cable ducts, as well as for threading into cable conduits. The cables are approved by VDE (certificate with production monitoring) and released for use in the area of operation of Deutsche Bahn AG.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **02YS** | conductor insulation made from cell PE with outer polyolefin layer |
| **F** | cable core filled with petroleum jelly, longitudinally watertight |
| **(L)2Y** | laminated sheath, transversally watertight |
| **St III** | starquad in the local cable |
| **Bd** | stranded in bundles |
| **(H42)** | Mutual capacitance max value 42 nF/km |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-02YSF(L)2Y from 10x... to 200x...

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Edition: 05/2016

# BayCom® - Railway telecommunication cables

## AJ-02YSF(L)2Y ... StIII - cores twisted to quads, Al-laminated sheath, Copper screen

...x2x0,8 acc. to DB Dlk 1.013.151y


similar to the illustration


### Standards

Dlk 1.013.151y and/or DIN VDE 0816-part 1.

The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,8 |
| Conductor resistance (pair of cores) Ω/km | ≤73.2 |
| Resistance difference Ω/km | ≥ 5 |
| Mutual capacitance at 800Hz nF/km | ≤ 42 |
| Capacitive couplings pF/km at 800 Hz | |
| k1 (98%/100% of all values) | ≤ 1333/2666 |
| k9-12 (98%/100% of all values) | ≤ 333/1000 |
| Operating voltage V | ≤ 225 |
| Alternating voltage test 50 Hz | |
| core-core Veff | 500 |
| core-screen Veff | 2000 |
| Temperature ranges | |
| during laying, installing °C | -20 to +50 |
| before and after laying, installing °C | -40 to +70 |

### Application

As induction-protected connection cable in subscriber networks and private branch exchanges, for telephony and data transfer. Suitable for laying in the ground and in cable ducts, as well as for threading into cable conduits.

The cables are approved by VDE (certificate with production monitoring) and released for the use in the area of operation of Deutsche Bahn AG.

### Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **02YS** | conductor insulation made from cell PE with outer polyolefin layer |
| **F** | cable core filled with petroleum jelly, longitudinally watertight |
| **(L)2Y** | laminated sheath, transversally watertight |
| **St III** | starquad in the local cable |
| **Bd** | stranded in bundles |
| **(H42)** | Mutual capacitance max value 42 nF/km |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- AJ-02YSF(L)2YDB2Y from 10x... to 200x...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

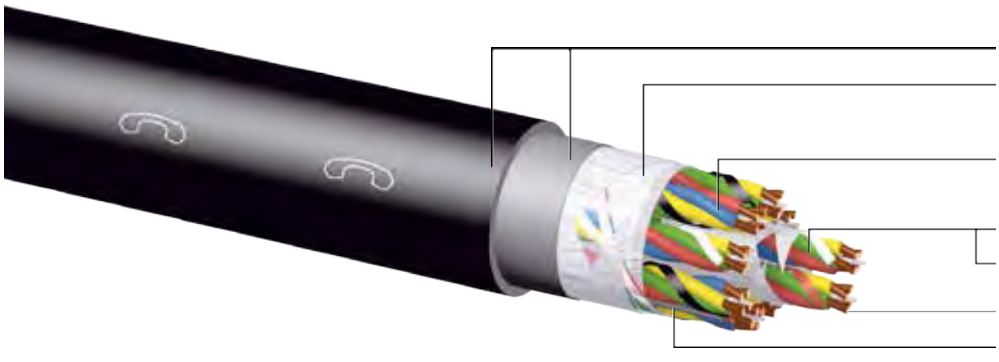


Edition: 05/2016

# BayCom® - Railway telecommunication cables

## A-02YSTF(L)2YV - cores twisted to quads, Reinforced sheath, control cores

reinforced laminated sheath acc. to Arcor TNP02 (DB AG)




similar to the illustration


## Standards

Arcor TNP 02, Bayka company standard BayCom®

## Technical Data

| (Values for BayCom®★ in parentheses) | | |
|---|---|---|
| Conductor diameter mm | 0,9 | 1,4 |
| Conductor resistance (pair of cores) Ω/km | ≤ 56.6 | ≤ 23.4 |
| Resistance difference Ω/km<br>(for conductors 0.9: BayCom®★:<br>max. 20 % of the values ≤ 0.25) | ≤ 0.30<br>(0.15) | ≤ 0.20<br>(0.18) |
| Insulation resistance GΩxkm | ≥ 10 | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km<br>(for 1.4 mm conductor diameter: 15 % of the values ≤ 40.3) | ≤ 34 | ≤ 36 |
| Capacitive coupling $k_1$ pF (at 800 Hz)<br>100 % of all values<br>80 % of all values | <br>≤ 400 (300)<br>≤ 110 | <br>≤ 400 (300)<br>≤ 110 |
| Capacitive coupling $k_{9\text{-}12}$ pF (at 800 Hz)<br>100 % of all values<br>80 % of all values | <br>≤ 400 (250)<br>≤ 110 | <br>≤ 400 (250)<br>≤ 110 |
| Wave attenuation dB/km (at 1 MHz)<br>100 % of all values<br>80 % of all values | <br>≤ 9,0 (8,5)<br>≤ 8,5 | |
| Near-end crosstalk attenuation NEXT dB<br>(HF-quad at 1 MHz)<br>within the quad<br>quad/quad within the group<br>quad/quad between the groups<br>for 2 HF quads<br>for 4 HF quads<br>for 6 HF quads<br>for 8 HF quads | <br>≥ 45 (48)<br>≥ 55<br>≥ 62<br>≥ 64<br>≥ 66<br>≥ 68 | |
| LF quads dB (at 1 MHz, BayCom®★ only)<br>within the quad<br>quad/quad within the group | <br>≥ 45<br>≥ 40 | |
| Far-end crosstalk attenuation ELFEXT<br>dB/km (at 1 MHz)<br>within the HF quad<br>within the LF quad (BayCom®★ only) | <br>≥ 45<br>≥ 45 | |

## Application

For general cabling at railway tracks. In the new construction case, as replacement types for the paper-insulated cables with F, TF, TFS and coax construction elements according to Dlk 1.01.106 of Deutsche Bahn AG. For laying in the ground, in pipe conduits and trough channels in accordance with the applicable regulations.

All trunk lines of the cables can be interconnected surge-free with trunk lines of the same nominal conductor diameter of the cables according to Dlk 1.01.106 (paper-metal sheath cables of the existing network).

BayCom®★ long-distance cables offer increased interference resistance and improved HF and LF properties compared to cables according to Arcor TNP 02.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable according to standard |
| **02YS** | conductor insulation made from cell PE with outer polyolefin layer (foam skin) |
| **TF** | cable core dry filled, longitudinally watertight |
| **(L)2YV** | reinforced laminated sheath, transversally watertight |
| **STI** | starquad in track cable quality (increased electrical properties) |
| **LG** | stranded in layers |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-02YSTF(L)2YV from 5x... to 30x...
- Use **www.bayka.de** or this QR-Code for our full portfolio:



Edition: 05/2016

# BayCom® - Railway telecommunication cables

## A-02YSTF(L)2YB2Y / A-02YSTF(L)2Y(SR)2Y - starquad, steel tape armouring

with armouring acc. to Arcor TNP02 (DB AG)


similar to the illustration




## Standards

Arcor TNP 02, Bayka company standard BayCom®

## Technical Data

| (Values for BayCom®★ in parentheses) | | |
|---|---|---|
| Conductor diameter mm | 0,9 | 1,4 |
| Conductor resistance (pair of cores) Ω/km | ≤ 56.6 | ≤ 23.4 |
| Resistance difference Ω/km<br>(for conductors 0.9: BayCom®★:<br>max. 20 % of the values ≤ 0.25) | ≤ 0.30<br>(0.15) | ≤ 0.20<br>(0.18) |
| Insulation resistance GΩxkm | ≥ 10 | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km<br>(for 1.4 mm conductor diameter: 15 % of the values ≤ 40.3) | ≤ 34 | ≤ 36 |
| Capacitive coupling $k_1$ pF (at 800 Hz)<br>100 % of all values<br>80 % of all values | <br>≤ 400 (300)<br>≤ 110 | <br>≤ 400 (300)<br>≤ 110 |
| Capacitive coupling $k_{9\text{-}12}$ pF (at 800 Hz)<br>100 % of all values<br>80 % of all values | <br>≤ 400 (250)<br>≤ 110 | <br>≤ 400 (250)<br>≤ 110 |
| Wave attenuation dB/km (at 1 MHz)<br>100 % of all values<br>80 % of all values | <br>≤ 9,0 (8,5)<br>≤ 8,5 | |
| Near-end crosstalk attenuation NEXT dB<br>(HF-quad at 1 MHz)<br>within the quad<br>quad/quad within the group<br>quad/quad between the groups<br>for 2 HF quads<br>for 4 HF quads<br>for 6 HF quads<br>for 8 HF quads | <br>≥ 45 (48)<br>≥ 55<br>≥ 62<br>≥ 64<br>≥ 66<br>≥ 68 | |
| LF quads dB (at 1 MHz, BayCom®★ only)<br>within the quad<br>quad/quad within the group | <br>≥ 45<br>≥ 40 | |
| Far-end crosstalk attenuation ELFEXT<br>dB/km (at 1 MHz)<br>within the HF quad<br>within the LF quad (BayCom®★ only) | <br>≥ 45<br>≥ 45 | |

## Application

For general cabling at railway tracks. In the new construction case, as replacement types for the paper-insulated cables with F, TF, TFS and coax construction elements according to Dlk 1.01.106 of Deutsche Bahn AG. For laying in the ground, in pipe conduits and trough channels in accordance with the applicable regulations.

All trunk lines of the cables can be interconnected surge-free with trunk lines of the same nominal conductor diameter of the cables according to Dlk 1.01.106 (paper-metal sheath cables of the existing network).

BayCom®★ long-distance cables offer increased interference resistance and improved HF and LF properties compared to cables according to Arcor TNP 02.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable according to standard |
| **02YS** | conductor insulation made from cell PE with outer polyolefin layer (foam skin) |
| **TF** | cable core dry filled, longitudinally watertight |
| **(L)2Y** | laminated sheath, transversally watertight |
| **B** | steel tape armouring |
| **(SR)** | steel channel sheath |
| **2Y** | outer sheath made of PE |
| **STI** | starquad in track cable quality (increased electrical properties) |
| **LG** | stranded in layers |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

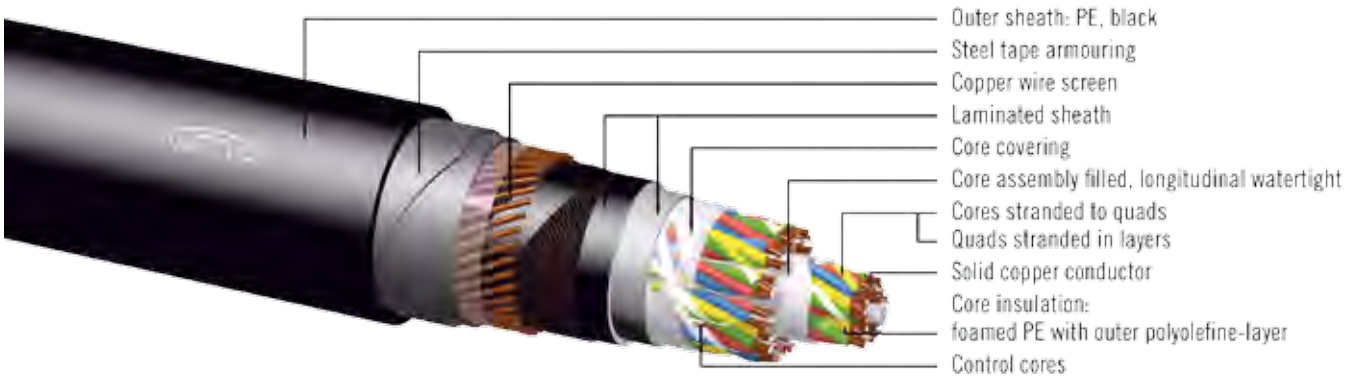
- A-02YSTF(L)2YB2Y 5x4x0,9 STI
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayCom® - Railway telecommunication cables

## AJ-02YSTF(L)2YDB2Y - cores stranded quads, copper wire screen, control cores

with inductive protection acc. to Arcor TNP02 (DB AG)




similar to the illustration


## Standards

Arcor TNP 02, Bayka company standard BayCom®

## Technical Data

| (Values for BayCom®★ in parentheses) | | |
|---|---|---|
| Conductor diameter mm | 0,9 | 1,4 |
| Conductor resistance (pair of cores) Ω/km | ≤ 56.6 | ≤ 23.4 |
| Resistance difference Ω/km<br>(for conductors 0.9: BayCom®★:<br>max. 20 % of the values ≤ 0.25) | ≤ 0.30<br>(0.15) | ≤ 0.20<br>(0.18) |
| Insulation resistance GΩxkm | ≥ 10 | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km<br>(for 1.4 mm conductor diameter: 15 % of the values ≤ 40.3) | ≤ 34 | ≤ 36 |
| Capacitive coupling k1 pF (at 800 Hz)<br>100 % of all values<br>80 % of all values | ≤ 400 (300)<br>≤ 110 | ≤ 400 (300)<br>≤ 110 |
| Capacitive coupling k9-12 pF (at 800 Hz)<br>100 % of all values<br>80 % of all values | ≤ 400 (250)<br>≤ 110 | ≤ 400 (250)<br>≤ 110 |
| Wave attenuation dB/km (at 1 MHz)<br>100 % of all values<br>80 % of all values | ≤ 9,0 (8,5)<br>≤ 8,5 | |
| Near-end crosstalk attenuation NEXT dB<br>(HF-quad at 1 MHz)<br>within the quad<br>quad/quad within the group<br>quad/quad between the groups<br>for 2 HF quads<br>for 4 HF quads<br>for 6 HF quads<br>for 8 HF quads | <br><br>≥ 45 (48)<br>≥ 55<br><br>≥ 62<br>≥ 64<br>≥ 66<br>≥ 68 | |
| LF quads dB (at 1 MHz, BayCom®★ only)<br>within the quad<br>quad/quad within the group | <br>≥ 45<br>≥ 40 | |
| Far-end crosstalk attenuation ELFEXT<br>dB/km (at 1 MHz)<br>within the HF quad<br>within the LF quad (BayCom®★ only) | <br>≥ 45<br>≥ 45 | |

## Application

For general cabling at railway tracks. In the new construction case, as replacement types for the paper-insulated cables with F, TF, TFS and coax construction elements according to Dlk 1.01.106 of Deutsche Bahn AG. For laying in the ground, in pipe conduits and trough channels in accordance with the applicable regulations.

All trunk lines of the cables can be interconnected surge-free with trunk lines of the same nominal conductor diameter of the cables according to Dlk 1.01.106 (paper-metal sheath cables of the existing network).

BayCom®★ long-distance cables offer increased interference resistance and improved HF and LF properties compared to cables according to Arcor TNP 02.

## Type Designation Codes

| | |
|---|---|
| **AJ** | outdoor cable with inductive protection |
| **02YS** | conductor insulation made from cell PE with outer polyolefin layer (foam skin) |
| **TF** | cable core dry filled, longitudinally watertight |
| **(L)2Y** | laminated sheath, transversally watertight |
| **D** | inductive protection made of copper wires |
| **B** | steel tape armouring |
| **2Y** | outer sheath made of PE |
| **STI** | starquad in track cable quality (increased electrical properties) |
| **LG** | stranded in layers |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- AJ-02YSTF(L)2YDB2Y from 1x... to 30x...
- Use **www.bayka.de** or this QR-Code for our full portfolio:

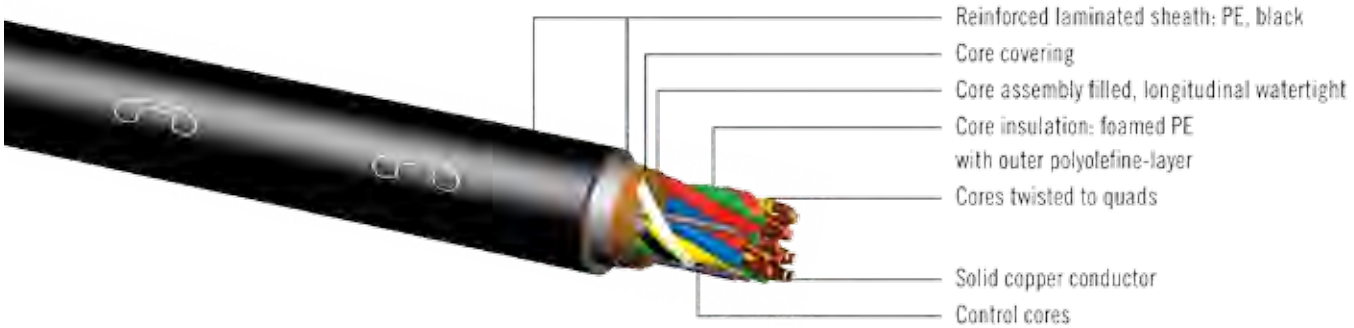


Edition: 05/2016

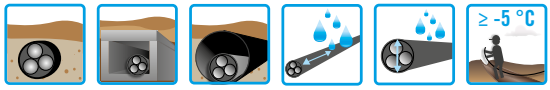
# BayCom® - Railway telecommunication cables

## A-02YSF(L)2YV / A-02YSF(L)2YB2Y / A-02YSF(L)2Y(SR)2Y - branch cable

acc. to Arcor TNP06 (DB AG)




similar to the illustration




### Standards

Arcor TNP 06

### Technical Data

| (Values for BayCom®★ in parentheses) | | |
|---|---|---|
| Conductor diameter mm | 0,9 | 1,4 |
| Conductor resistance (pair of cores) Ω/ km | ≤ 56.6 | ≤ 23.4 |
| Insulation resistance GΩxkm | ≥ 10 | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | | |
| 100 % of all values | ≤ 38 | ≤ 40.3 |
| 85 % of all values | ≤ 34 | ≤ 36 |
| Capacitive coupling $k_1$ pF (at 800 Hz) | | |
| 100 % of all values | ≤ 400 | ≤ 400 |
| 80 % of all values | ≤ 110 | ≤ 110 |
| Capacitive coupling $k_{9\text{-}12}$ pF (at 800 Hz) | | |
| 100 % of all values | ≤ 400 | ≤ 400 |
| 80 % of all values | ≤ 110 | ≤ 110 |
| Alternating voltage test 50 Hz | | |
| core-core Veff | 500 | 500 |
| ore-screen Veff | 2000 | 2000 |

### Application

For general application as standardised branch cane in existing track communication cable systems in paper-metal sheath design (according to Dlk. 1.01.106 - Deutsche Bahn AG) and in new systems installed using cables according to technical data sheet Arcor TNP 05.

For laying in the ground, in pipe conduits and trough channels in accordance with the applicable regulations. All trunk lines of the cables can be interconnected surge-free with trunk lines of the same nominal conductor diameter of the cables according to Dlk 1.01.106 (paper-metal sheath cables of the existing network).

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable according to standard |
| **02YS** | conductor insulation made from cell PE with outer polyolefin layer (foam skin) |
| **F** | cable core filled with petroleum jelly, longitudinally watertight |
| **OF** | cable core filled with filling material with low relative permittivity, longitudinally watertight |
| **TF** | cable core dry filled with swelling yarns and swelling fleeces, longitudinally watertight |
| **(L)2Y** | laminated sheath, transversally watertight |
| **(L)2YV** | reinforced laminated sheath, transversally watertight |
| **B** | steel tape armouring |
| **(SR)** | steel channel sheath |
| **2Y** | outer sheath made of PE |
| **STI** | starquad in track cable quality (increased electrical properties) |
| **LG** | stranded in layers |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- A-02YSF(L)B2Y from 2... to 3...
- Use **www.bayka.de** or this QR-Code for our full portfolio:

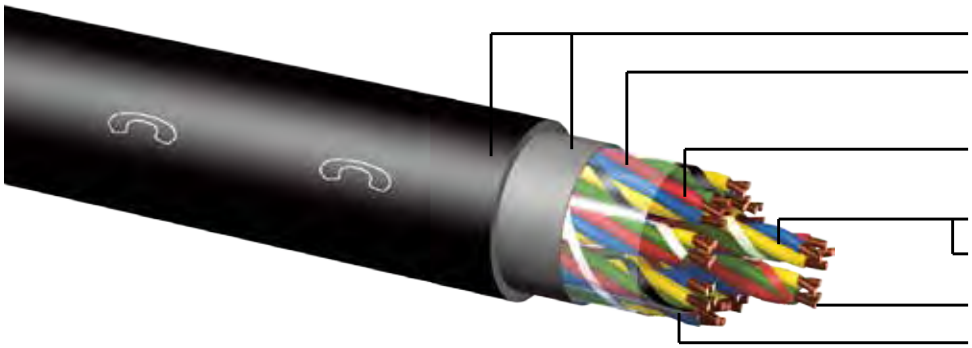


Edition: 05/2016

# BayCom® - Railway telecommunication cables

## A-02YSTF(L)2YV / A-02YSTF(L)2YB2Y / A-02YSTF(L)2Y(SR)2Y - ST I, rail-foot cables

acc. to DB TL 416.0520




similar to the illustration


## Standards

DB TL 416.0520

## Technical Data

| | | |
|---|---|---|
| Conductor diameter mm | 0,7 | 1,5 |
| Conductor resistance (pair of cores) Ω/km | ≤ 54.5 | ≤ 22.5 |
| Insulation resistance GΩxkm | ≥ 10 | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 34 | ≤ 38 |
| Characteristic impedance Ω | | |
| at 800 Hz | ≈565 | ≈350 |
| at 1 Mhz | ≈150 | ≈150 |
| Wave attenuation dB/km | | |
| at 800 Hz | ≤ 0.6 | ≤ 0.4 |
| at 1 MHz | ≤ 8.6 | ≤ 8.5 |
| Near-end crosstalk attenuation HF quad dB | | |
| at 1 MHz | ≥ 45 | ≥ 45 |
| an (within the quad) | ≥ 55 | ≥ 55 |
| an (quad/quad within the groups) | | |
| Far-end crosstalk attenuation HF quad dB/km | ≥ 45 | ≥ 45 |
| at 1 MHz | | |

## Application

For general cabling in telecommunication systems of DB AG, in particularly along tracks.

The cable is to be preferred for laying along or in the rail foot at train speeds up to 160 km/h or in further areas with increased vibration loads according to the applicable regulations, but also for laying in the ground, in pipe conduits and trough channels.

Not approved for use as overland line.

The cable is resistant against impact, vibration, and shock loads and features an UV-resistant outer sheath.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable according to standard |
| **02YS** | conductor insulation made from cell PE with outer polyolefin layer (foam skin) |
| **TF** | cable core dry filled, longitudinally watertight |
| **(L)2Y** | laminated sheath, transversally watertight |
| **(L)2YV** | reinforced laminated sheath, transversally watertight |
| **B** | steel tape armouring |
| **(SR)** | steel channel sheath |
| **2Y** | outer sheath made of PE |
| **STI** | starquad in track cable quality (increased electrical properties) |
| **LG** | stranded in layers |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-02YSTF(L)2YB2Y from 3x... to 5x...
- Use **www.bayka.de** or this QR-Code for our full portfolio:

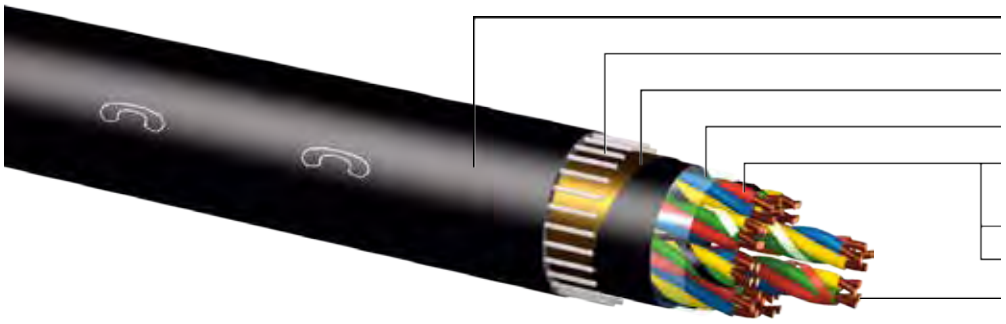


Edition: 05/2016

# BayCom® - Railway telecommunication cables

## A-02YS2Y(ST)(ZG)2Y - ST I, aerial cables

acc. to Arcor TNP04 (DB AG)




similar to the illustration


### Standards

Arcor TNP 04

### Technical Data

| | |
|---|---|
| Conductor diameter mm | 0,9 |
| Conductor resistance (pair of cores) Ohm/km | ≤ 56.6 |
| Resistance difference Ohm/km | ≤ 0.30 |
| Insulation resistance GOhmxkm | ≥ 10 |
| Mutual capacitance at 800 Hz nF/km | ≤ 36 |
| Capacitive coupling k1 pF at 800 Hz | |
| 100 % of all values | ≤ 400 |
| 80 % of all values | ≤ 100 |
| Capacitive coupling k9-12 pF at 800 Hz | |
| 100 % of all values | ≤ 400 |
| 80 % of all values | ≤ 100 |
| Wave attenuation at 1 MHz dB/km | |
| 100 % of all values | ≤ 9.0 |
| 80 % of all values | ≤ 8.5 |
| Near-end crosstalk attenuation NEXT HF quad dB at 1 MHz | |
| an (quad) | ≥ 45 |
| an (quad/quad within a group) | ≥ 55 |
| an (quad/quad between the groups) | ≥ 62 |
| Far-end crosstalk attenuation ELFEXT HF quad dB/km at 1 MHz | |
| af (quad) | ≥ 45 |

### Application

For general cabling at railway tracks for the new construction case. For mounting to rods and further nodes of above-ground track construction according to the applicable regulations.

Not approved as rail foot cable. All trunk linesof the cables can be interconnected surge-free with trunk lines of the same nominal conductor diameter of the cables according to Dlk 1.01.106 - Deutsche Bahn AG (paper-metal sheath cables of the existing network).

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable according to standard |
| **02YS** | conductor insulation made from cell PE with outer polyolefin layer (foam skin) |
| **(St)** | static screen |
| **(ZG)** | composite construction: PE sheath with force-fittingly embedded glass yarns |
| **2Y** | outer sheath made of PE |
| **STI** | starquad in track cable quality (increased electrical properties) |
| **LG** | stranded in layers |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- A-02YS(ST)(ZG)2Y from 5... to 16...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

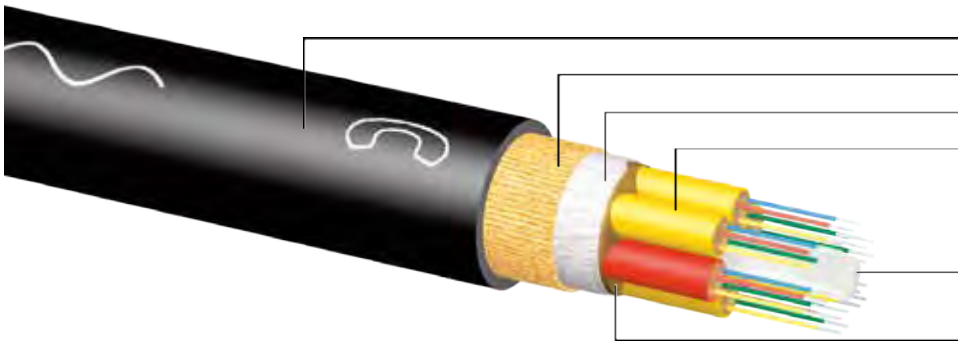


Edition: 05/2016

# BayCom® - Railway telecommunication cables

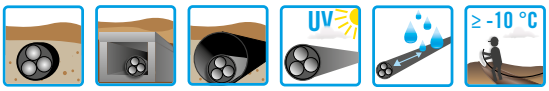
## A-DF(ZN)2Y - Outdoor FO-cable

acc. to DB Dlk 1.011.003y



Outer sheath: PE, black
Non metallic strain bearing elements
Swelling fleece
Unit cores with 2 up to 12 fibres
(E9/125, G50/125 or G62,5/125)
(pilot bundle red, other bundles yellow)
Central non metallic support element
Core assembly filled, longitudinal watertight

similar to the illustration




## Standards

DB Dlk 1.011.003y
The cables are compliant to RoHS EU Directive 2011/65/EU - RoHS 2.0 and Regulation no. 1907/2006 (REACH), current as of 20.06.2013.

## Technical Data

| | |
|---|---|
| Type of fibre | E9/125 |
| Field diameter µm | 9-10 |
| Cladding diameter µm | 125 |
| Attenuation dB/km | |
| at 1310 nm | ≤ 0,36 |
| at 1550 nm | ≤ 0,23 |
| Chromatic dispersion ps/[nm x km] | |
| at 1310 +30/-15 nm | ≤ 3,5 |
| at 1550 +30/-70 nm | ≤ 18 |
| Permissible temperature range °C | |
| transport and storage | -40 to +70 |
| laying | -10 to +60 |
| operation | -30 to +70 |

## Application

The FO outdoor cable according to this standard can be laid

- for laying in the ground,
- in the ground by pulling or blowing into a previously installed HDPE pipe or
- in trays along railway lines.

Use, planning and laying shall be carried out according to the applicable guidelines of the DB AG. The cables are approved for use in the DB AG network.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **D** | loose tube, filled |
| **F** | cable core filled with petrojelly - longitudinally watertight |
| **(ZN)** | non-metallic strength members |
| **2Y** | outer sheath made of polyethylene, PE |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-DF(ZN)2Y from 6x2... to 16x12...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

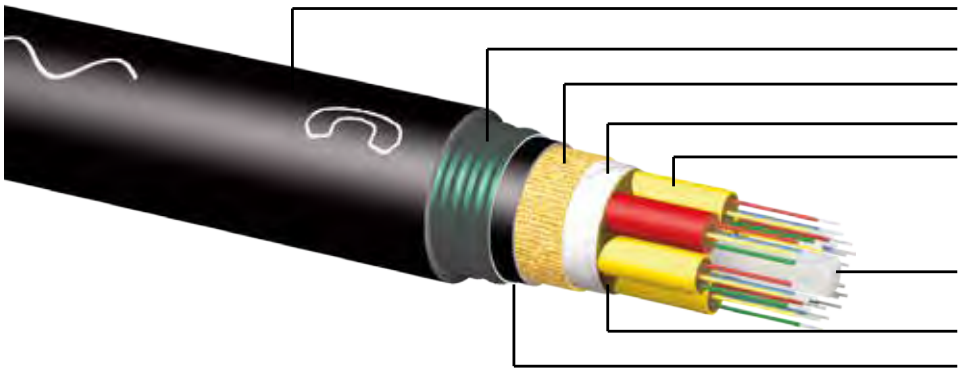


Edition: 05/2016

# BayCom® - Railway telecommunication cables

## A-DF(ZN)2Y(SR)2Y - with metallic armouring, longitudinally watertight, stranded loose tube

acc. DB Dlk 1.011.003y




similar to the illustration


### Standards

DB Dlk 1.011.003y
The cables are compliant to RoHS EU Directive 2011/65/EU - RoHS 2.0 and Regulation no. 1907/2006 (REACH), current as of 20.06.2013.

### Technical Data

| | |
|---|---|
| Type of fibre | E9/125 |
| Field diameter µm | 9-10 |
| Cladding diameter µm | 125 |
| Attenuation dB/km | |
| at 1310 nm | ≤ 0,36 |
| at 1550 nm | ≤ 0,23 |
| Chromatic dispersion ps/[nm x km] | |
| at 1310 +30/-15 nm | ≤ 3,5 |
| at 1550 +30/-70 nm | ≤ 18 |
| Permissible temperature range °C | |
| transport and storage | -40 to +70 |
| laying | -10 to +60 |
| operation | -30 to +70 |

### Application

The FO outdoor cable according to this standard can be laid

- in the ground by pulling into a previously installed HDPE pipe or
- in trays along railway lines.

Use, planning and laying shall be carried out according to the applicable guidelines of the DB AG. The cables are approved for use in the DB AG network.

### Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **D** | loose tube, filled |
| **F** | cable core filled with petrojelly - longitudinally watertight |
| **(ZN)** | non-metallic strength members |
| **2Y** | inner sheath made of polyethylene, PE |
| **(SR)** | corrugated steel tape armouring |
| **2Y** | outer sheath made of polyethylene, PE |
| **LG** | stranded in layers |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- A-DF(ZN)2Y(SR)2Y from 6x2... to 12x12...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

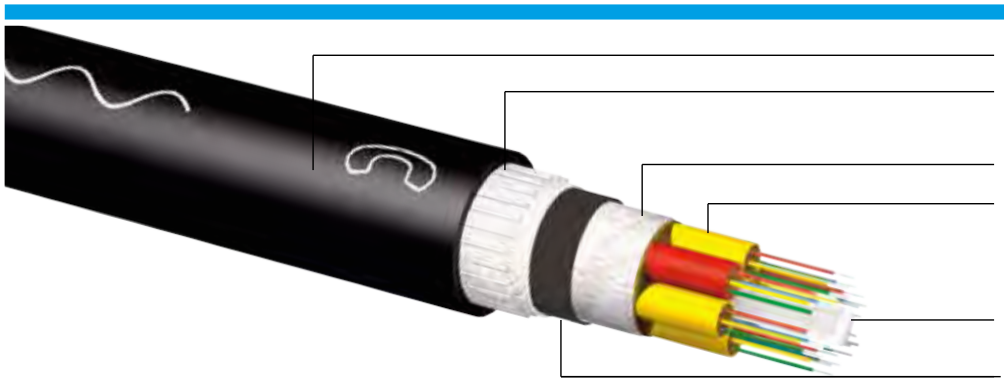


Edition: 05/2016

# BayCom® - Railway telecommunication cables

## A-D2Y(ZN)2Y - FO aerial cables, selfsupporting

acc. to DB Dlk 1.011.003y




similar to the illustration


## Standards

acc. to DB Dlk 1.011.005y
The cables are compliant to RoHS EU Directive 2011/65/EU - RoHS 2.0 and Regulation no. 1907/2006 (REACH), current as of 20.06.2013.

## Technical Data

| | |
|---|---|
| Type of fibre | E9/125 |
| Field diameter µm | 9-10 |
| Cladding diameter µm | 125 |
| Attenuation dB/km | |
| at 1310 nm | ≤ 0,36 |
| at 1550 nm | ≤ 0,23 |
| Chromatic dispersion ps/[nm x km] | |
| at 1310 +30/-15 nm | ≤ 3,5 |
| at 1550 +30/-70 nm | ≤ 18 |
| Permissible temperature range °C | |
| transport and storage | -25 to +60 |
| laying | -15 to +50 |
| operation | -40 to +60 |

## Application

FO aerial cable ADSS (All-Dieletric Self-Supporting) for installation on overhead contact line poles, wood and other poles of DB AG. For planning and installation of this cable the directive „planning, construction, maintenance and inspection of fibre optic aerial cables at overhead contact line poles“ applies.

The cable is UV-resistant, resistant against shotgun pellets and suitable for use with high tensile, lateral pressure, vibration, bending and impact loading.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **D** | loose tube, filled |
| **2Y** | inner sheath made of polyethylene, PE |
| **(ZN)** | non-metallic strength members |
| **2Y** | outer sheath made of polyethylene, PE |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- A-DF(ZN)2Y from 6x2... to 12x12...

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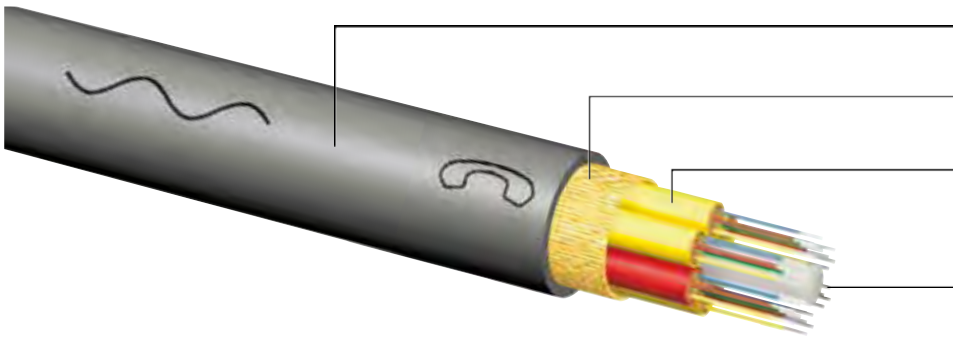
Edition: 05/2016

# BayCom® - Railway telecommunication cables

## I-D(ZN)H Arcor TNP07 E9/125 - FO indoor cables (FRNC/LSOH)

acc. to Arcor TNP07 (DB AG)




similar to the illustration



### Standards

acc. to Arcor TNP 07.

The cables are in compliance with RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

### Technical Data

| | |
|---|---|
| Type of fibre | E9/125 |
| Field diameter µm | 8.6-9.5 |
| Cladding diameter µm | 125 |
| Attenuation dB/km | |
| at 1310 nm | ≤ 0,40 |
| at 1550 nm | ≤ 0,30 |
| Chromatic dispersion ps/[nm x km] | |
| at 1310 +60/-30 nm | ≤ 5 |
| at 1550 +30/-70 nm | ≤ 21 |
| at 1550 nm | ≤ 19 |
| Permissible temperature range °C | |
| transport and storage | -25 to +70 |
| laying | -5 to +50 |
| operation | -5 to +70 |

### Application

FO indoor cable for installation in buildings

- as continuation of outdoor cables up to the cable termination equipment, and
- from cable termination equipment to distributors (in special cases)
- for in-house networks (multi-mode with graded index fibres)

This indoor cable is designed for laying on cable grids, grid routes, cable channels and raised floors. It is not designed for laying in the ground nor for outdoor installations.

FO indoor cables are available with central loose tube or with stranded loose tubes.

### Type Designation Codes

| | |
|---|---|
| **I** | indoor cable |
| **D** | loose tube, filled |
| **(ZN)** | non-metallic tensile reinforcement |
| **H** | outer sheath made of halogen-free, flame retardant copolymer |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- I-D(ZN)H from 1x4... to 6x12...

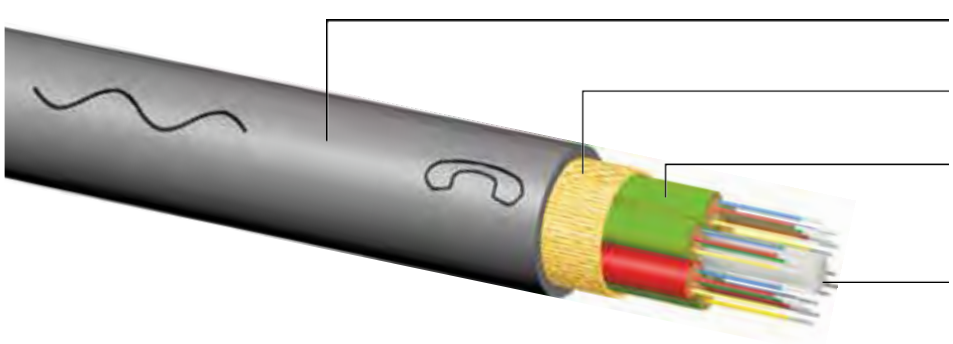
- Use **www.bayka.de** or this QR-Code for our full portfolio:

Edition: 05/2016

# BayCom® - Railway telecommunication cables

## I-D(ZN)H Arcor TNP07 G50/125 - FO indoor cables (FRNC/LSOH)

acc. to Arcor TNP07 (DB AG)




similar to the illustration

## Standards

acc. to Arcor TNP 07

The cables are in compliance with RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Type of fibre | G50/125 |
| Core diameter µm | 50±0.3 |
| Sheath diameter µm | 125±0.3 |
| Fibre attenuation dB/km | |
| at 850 nm | ≤ 2,5 |
| at 1300 nm | ≤ 1,0 |
| Bandwidth MHz x km | |
| at 850 nm | ≥ 500 |
| at 1300 nm | ≥ 500 |
| Permissible temperature range °C | |
| transport and storage | -25 to +70 |
| laying | -5 to +50 |
| operation | -5 to +70 |

## Application

FO indoor cable for installation in buildings

- as continuation of outdoor cables up to the cable termination equipment, and
- from cable termination equipment to distributors (in special cases)
- for in-house networks (multi-mode with graded index fibres)

This indoor cable is designed for laying on cable grids, grid routes, cable channels and raised floors. It is not designed for laying in the ground nor for outdoor installations.

FO indoor cables are available with central loose tube or with stranded loose tubes.

## Type Designation Codes

| | |
|---|---|
| **I** | indoor cable |
| **D** | loose tube, filled |
| **(ZN)** | non-metallic tensile reinforcement |
| **H** | outer sheath made of halogen-free, flame retardant copolymer |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- I-D(ZN)H from 1x4... to 6x12...

- Use **www.bayka.de** or this QR-Code for our full portfolio:

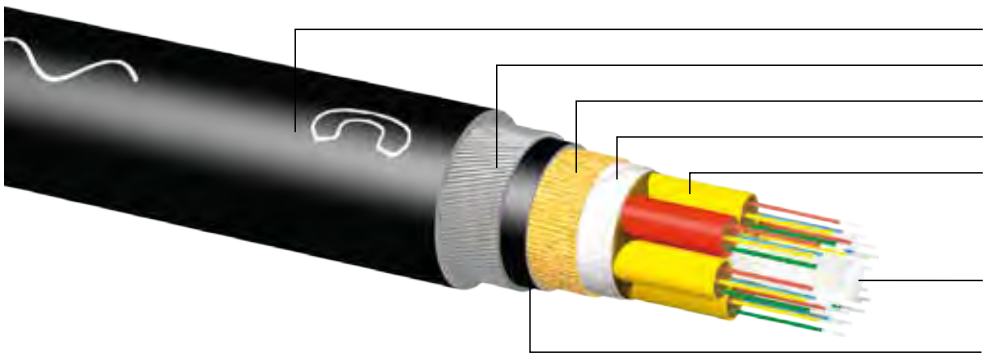


Edition: 05/2016

# RailOptic® - SFK FO rail foot cable

## A-DQ(ZN)(L)2YRG2Y - rail foot cable

acc. to DB TL 416.0510



Outer sheath: PE, black
Steel wire armouring
Non metallic tensile reinforcement
Swellable tape
Unit cores with 2 up to 12 fibres
pilot bundle red, other bundles
yellow (E9), green (G50) or blue (G62,5)
Central non metallic support element
Inner Sheath: Al-laminated PE, black

similar to the illustration


## Standards

Technical specifications DB TL 416.0510,
Bayka RailOptic SFK company standard.

The cables are in compliance with EU LVD (Low Voltage Directive 73/23/EEC) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Fibre type single-mode fibre | E9...10 |
| Core diameter µm | 9 |
| Sheath diameter µm | 125 |
| Fibre attenuation dB/km | |
| at 1310 nm | ≤ 0,36 |
| at 1550 nm | ≤ 0,23 |
| Chromatic dispersion ps/[nm x km] | |
| at 1310 +30/-15 nm | ≤ 3,5 |
| at 1550 +30/-70 nm | ≤ 18 |
| Temperature ranges | |
| During laying, installing along the rail foot °C | +5 to +25 (+35) |
| Additional laying specification must be observed starting from 25 °C | |
| Operating °C | -25 to +60 |

The specifications in the technical bulletins of DB AG apply for planning and construction.

## Application

RailOptic® SFK FO rail foot cables are suitable for the use in telecommunication systems. They are preferred for laying directly along the rail foot or other areas with vibration and impact loads. They are also suitable for laying in the ground, in trough channels and pipe conduits.

The laying of cables along the rail foot is an economical variation for cable systems for regional and branch lines, for site clearance and troubleshooting. Compared to traditional cable lines, the design and installation expense is considerably reduced, since no civil engineering work is required.

The installation can be carried out by qualified companies without special vehicles, tools and with standard rail foot clamps. The cable accessories (joints, final boxes) come from the standard program of Tyco Electronics.

Rail Optic ® SFK FO rail foot cables are universal and can be installed together with BayRail® Cu rail foot cables.

## Type Designation Codes

| | |
|---|---|
| **A** | outdoor cable |
| **D** | loose tube, filled |
| **Q** | cable core dry filled, longitudinally watertight |
| **(ZN)** | non-metallic stress relief elements |
| **(L)2Y** | laminated sheath, transversally watertight |
| **RG** | steel wire armouring, rodent-proof |
| **2Y** | outer sheath made of PE |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications

## Product range

- RailOptic® A-DQ(ZN)(L)2YRG2Y from 6x4 to 6x12
- Use **www.bayka.de** or this QR-Code for our full portfolio:



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# Grounding & power cables

## Grounding Cables

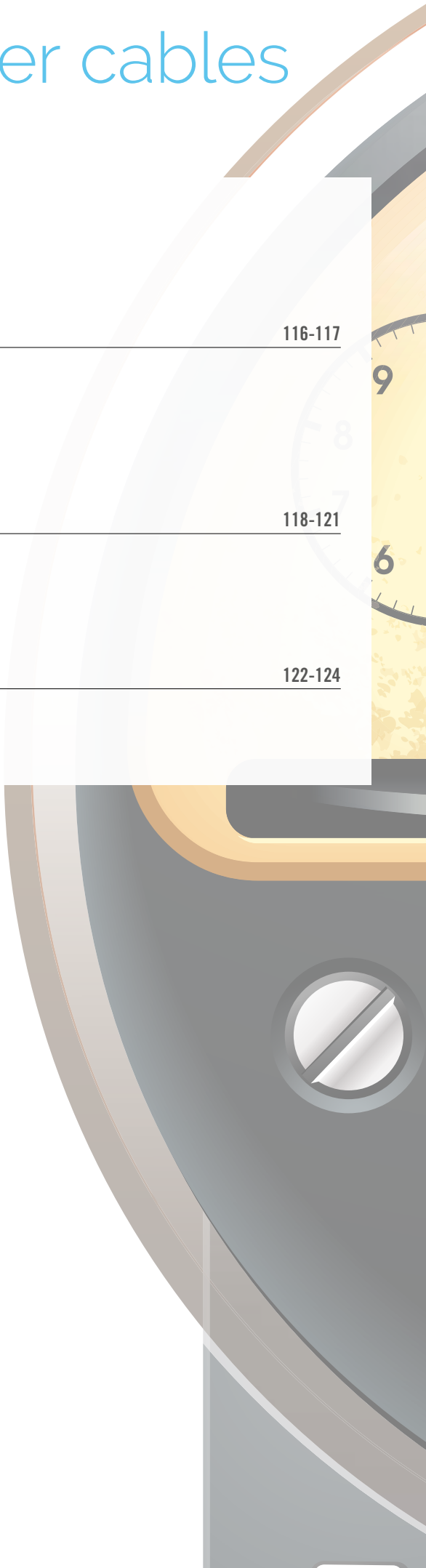


## Power Cables ≤ 1 kV



## Power Cables 3-6 kV



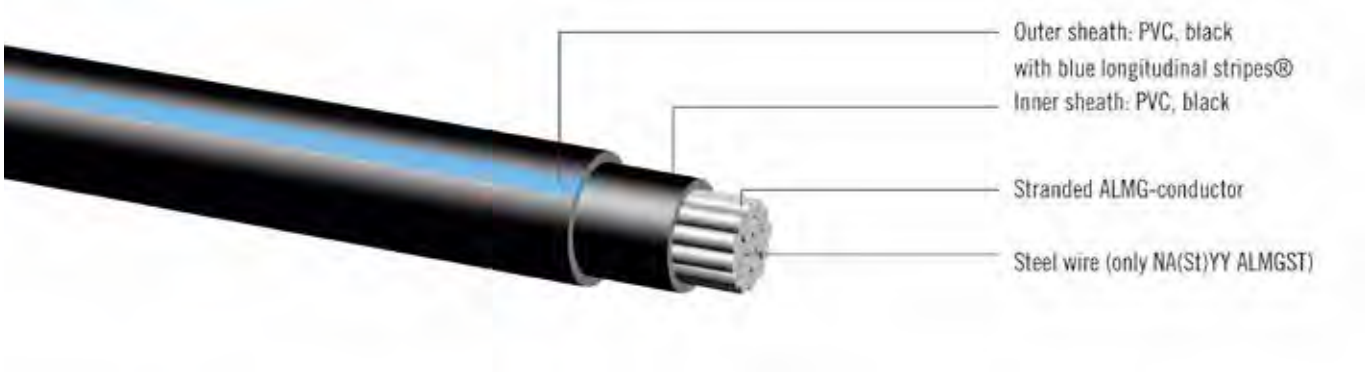



KILOWATT-HOURS
POWER
METER

# BayEnergy® Railway grounding cables

## (N)AYY / (N)A(St)YY / (N)A(St)2XH - 1-core, theft defence

acc. to Bayka standard BayEnergy 01, resp. 02




similar to the illustration


### Optional:


## Standards

Bayka company standard BayEnergy 02.
The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

The design with improved behaviour in the event of fire is halogen-free according to DIN EN 50267-2-2, flame retardant according to DIN EN 60332-1-2.

## Technical Data

| | | | |
|---|---|---|---|
| Rated voltage $U_0/U$ kV | | 0,6/1 | |
| Nominal cross section mm² | 75 | 100 | 110 |
| Conductor resistance Ω/km | ≤ 0.468 | ≤ 0.365 | ≤ 0.32 |

Short-circuit current
according to Deutsche Bahn standard 997.0205A01 (1.3.2003) paragraph 2 “current carrying capability”

Vibration resistance
according to Dlk 1.013.168y (sinusoidal oscillation load type 1)

| | |
|---|---|
| Permissible temperature range °C | |
| during laying, installing and similar | -10 to +60 |
| before and after laying | -30 to +60 |

## Application

BayEnergy® aluminium railway grounding cables are used as grounding connection resistant to short-circuit current, for potential equalisation between rails and conductive parts not under voltage (e.g. posts, brackets of train preheating equipment, acoustic barriers, handrails). The advanced and improved railway grounding cables are marked using two blue Bayka identification strips® on the outer sheath, and document Bayka quality „made in Germany“.

BayEnergy® aluminium railway grounding cables are approved by Germany‘s Federal Railway Office (EBA) and released for use in the area of operation of Deutsche Bahn AG. The imprint „Property of DB“ or „Property of the Transport Services“ is used as property notice and as theft defence. BayEnergy® aluminium railway grounding cables can be easily differentiated from copper grounding cables keeping potential thieves away. Further properties:

- Resistant against impact, vibration and shock loads
- UV-resistant
- Torsion-free laying can be easily checked
- Easy laying and installation, handling with standard tools

In the case of DB AG, the EBA-approved design versions (N)AYY-O 1x110 ALMG and (N)A(St)YY-O 1x100 and/or 110 ALMGST, with special cable lug with adjusted diameter and water-tight aluminium for the short-circuit range greater 25 kA, are released for direct connection to the rail foot. The design with improved behaviour in the event of fire is provided for installations in tunnels.

## Type Designation Codes

| | |
|---|---|
| **(N)** | cables based on standard |
| **A** | conductor made from aluminium |
| **(ST)** | steel wire |
| **Y** | insulation made of polyvinyl chloride (PVC) |
| **Y** | sheath made of polyvinyl chloride (PVC) |
| **2X** | insulation made of cross-linked polyethylene (XLPE) |
| **H** | sheath made of halogen-free, flame retardant copolymer |
| **-O** | cable without green-yellow core |
| **1x110** | no. of cores x cross-section |
| **RM** | circular conductor, stranded |
| **ALMG** | aluminium alloy |
| **ALMGST** | aluminium alloy with steel wire |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications

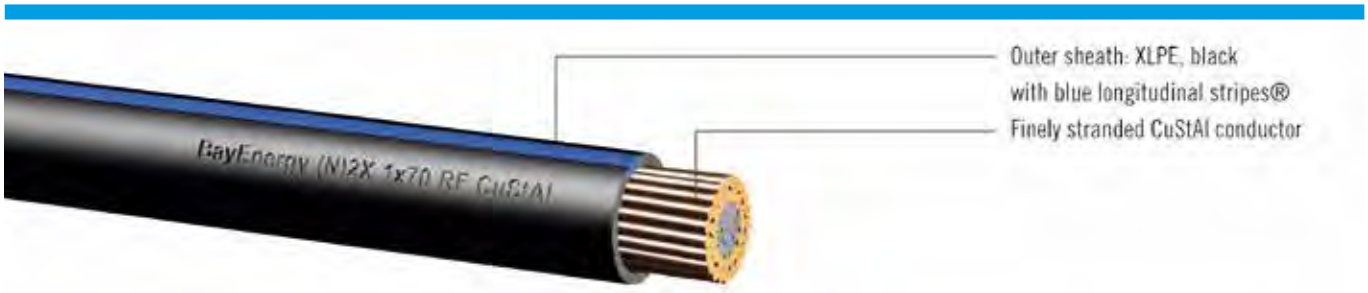


Edition: 05/2016

# BayEnergy® Railway grounding cables

## (N)2X CuStAl - 1-core, theft defence

acc. to Bayka standard BayEnergy 01, resp. 02




similar to the illustration


## Standards

Bayka company standard BayEnergy 01.
The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

## Technical Data

| | |
|---|---|
| Rated voltage $U_0$/U kV | 0,6/1 |
| Nominal cross section mm² | 70 |
| Conductor resistance Ω/km | ≤ 0.375 |

Short-circuit current
according to Deutsche Bahn standard 997.0205A01 (1.3.2003) paragraph 2 “current carrying capability”

| | |
|---|---|
| Permissible temperature range °C during laying, installing and similar | -10 to +60 |
| before and after laying | -30 to +60 |

## Application

BayEnergy® flexible railway grounding cables are used as grounding connection resistant to short-circuit current, for potential equalisation between rails and other conductive parts not under voltage. They are especially used, where high flexibility and a low bending radius are required.

The grounding cable is halogen-free, suitable for indoor and outdoor applications, however not directly in the ground. The advanced and improved railway grounding cables are marked using two blue Bayka identification strips® on the outer sheath, and document Bayka quality “made in Germany”.

BayEnergy® flexible railway grounding cables are approved by Germany‘s Federal Railway Office (EBA) and released for use in the area of operation of Deutsche Bahn AG.

The imprint „Eigentum DB“ (Property of DB) or „Eigentum Verkehrsbetriebe“ (Property of the Transport Services) is used as property notice and as theft protection. BayEnergy® aluminium railway grounding cables can be easily differentiated from copper grounding cables keeping potential thieves away. Further properties:

- Resistant against impact, vibration and shock loads
- UV-resistant
- Torsion-free laying can be easily checked
- Easy laying and installation, handling with standard tools

## Type Designation Codes

| | |
|---|---|
| **(N)** | cables based on standard |
| **2X** | sheath made of cross-linked polyethylene (XLPE) |
| **H** | outer protective sheath made from halogen-free, flame-retardant copolymer |
| **1x70** | no. of cores x cross-section |
| **RF** | circular conductor, finely stranded |
| **CuStAl** | conductor made from copper wires and copper-plated aluminium and steel wires |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- (N)2X from 1x50 to 1x70

- Use **www.bayka.de** or this QR-Code for our full portfolio:

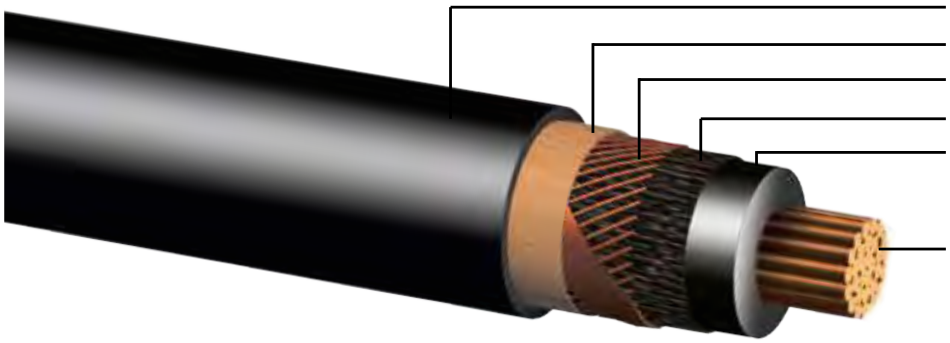


Edition: 05/2016

# BayEnergy® Railway power cables - 1 kV

## N2XS... - stranded copper conductor, XLPE-insulated, screened

acc. to, resp. based on DIN VDE 0271




similar to the illustration


### Optional:


## Standards

DIN VDE 0271.
The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

They are free of silicone, cadmium and free from substances harmful to the wetting properties of lacquers.

Cables with PVC sheath are flame retardant and self-extinguishing according to DIN EN 50265-2-1 (IEC 60332-1).

Cables with PE sheath are UV-resistant, however not flame retardant.

## Technical Data

| | |
|---|---|
| Rated voltage kV | 0,6/1 |
| Testing voltage kV | 4 |
| Cable temperature °C | |
| during laying (min) | -5 |
| after laying: | |
| PVC-insulated cables (max) | +70 |
| XLPE-insulated cables (max) | +90 |
| Max permissible operating temperature (conductor) °C | |
| PVC-insulated cables | +70 |
| XLPE-insulated cables | +90 |
| Short-circuit temperature °C | |
| PVC-insulated cables | +160 |
| XLPE-insulated cables | +250 |
| Current carrying capacity, PVC-insulated cables acc. to HD 603 S1-1994 3G | |
| Current carrying capacity, XLPE-insulated cables acc. to HD 603 S1-1994 5G | |
| during regular operation: table 14+15 | |
| in case of short-circuit: table 17 | |
| short-circuit duration max 5s | |

## Application

Cables for special applications, e.g. as a single-core railway traction current cable for direct current and alternating current. Also as a return current cable in direct current systems up to 0.6/1 KV.

Preferably for connections in overhead lines and rails, for laying in pipe conduits and trough channels and directly in the ground. The regulations and standards of the transport services apply for the selection of railway traction current cables.

## Type Designation Codes

| | |
|---|---|
| **N** | cables acc. to standard |
| **2X** | insulation made of cross-linked polyethylene (XLPE) |
| **S** | screen made of copper |
| **(F)** | longitudinally watertight in the screen section |
| **Y** | outer sheath made of polyvinyl chloride (PVC) |
| **2Y** | outer sheath made of polyethylene (PE) |
| **RM** | circular conductor, stranded |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- N2XSY from 1x150... to 1x500...
- N2XS2Y from 1x150... to 1x630...
- N2XS(F)2Y from 1x150... to 1x500...

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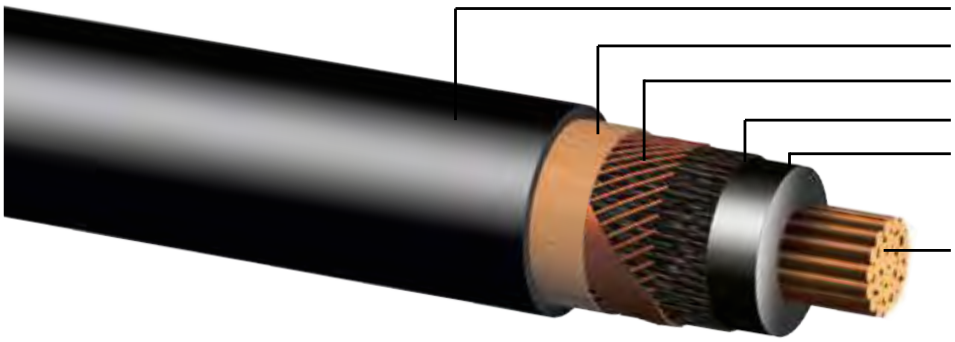
Edition: 05/2016

# BayEnergy® Railway power cables - 1 kV

## N2XS... - stranded copper conductor, XLPE-insulated, screened, halogen-free

acc. to, resp. based on DIN VDE 0271




similar to the illustration


**Optional:**


### Standards

DIN VDE 0271.
Low gas corrosivity acc. to EN 50267,
low toxicity of gases acc. to DIN EN 50305,
low smoke density acc. to DIN EN 61034-2,
flame retardant acc. to IEC 60332-3, EN 50266-2-4.
The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.
They are free of silicone, cadmium and free from substances harmful to the wetting properties of lacquers.
The cables are halogen-free, fire retardant and low-smoke.
(FRNC - flame retardant, non corrosive, LSOH - low smoke, zero halogen).

### Technical Data

| | |
|---|---|
| Rated voltage kV | 0,6/1 |
| Testing voltage kV | 4 |
| Cable temperature °C | |
| during laying (min) | -5 |
| after laying (max) | +90 |
| Max permissible operating temperature (conductor) °C | +90 |
| Short-circuit temperature °C | +250 |
| Current carrying capacity | |
| acc. to HD 603 S1-1994 5G | |
| during regular operation: table 14+15 | |
| in case of short-circuit: table 17 short-circuit duration max 5s | |

### Application

Cables for special applications, e.g. as a single-core railway traction current cable for direct current and alternating current. Also as a return current cable in direct current systems up to 0.6/1 KV.
Preferably for connections in overhead lines and rails, for laying in pipe conduits and trough channels, however not directly in the ground.
The regulations and standards of the transport services apply for the selection of railway traction current cables.

### Type Designation Codes

| | |
|---|---|
| **N** | cables acc. to standard |
| **(N)** | cables based on standard |
| **2X** | insulation made of cross-linked polyethylene (XLPE) |
| **S** | screen made of copper |
| **(F)** | longitudinally watertight in the screen section |
| **H** | sheath made of thermoplastic, halogen-free polyolefin |
| **RM** | circular conductor, stranded |

### Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

### Product range

- N2XSH from 1x150 to 1x630
- N2XS(F)H from 1x150 to 1x500

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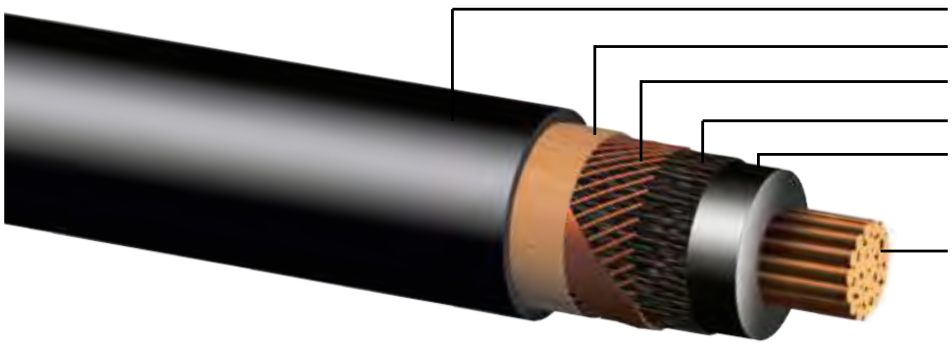
Edition: 05/2016

# BayEnergy® Railway power cables - 1 kV

## NYSY - stranded copper conductor, PVC-insulated, screened

acc. to, resp. based on DIN VDE 0271




similar to the illustration


**Optional:**


## Standards

DIN VDE 0271.
The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

They are flame retardant and self-extinguishing according to DIN EN 50265-2-1 (IEC 60332-1-2) and free of silicone, cadmium and free from substances harmful to the wetting properties of lacquers.

## Technical Data

| | |
|---|---|
| Rated voltage kV | 0,6/1 |
| Testing voltage kV | 4 |
| Cable temperature °C | |
| during laying (min) | -5 |
| after laying C | +70 |
| Max permissible operating temperature (conductor) °C | +70 |
| Short-circuit temperature °C | +160 |
| Current carrying capacity, PVC-insulated cables acc. to HD 603 S1-1994 3G | |
| during regular operation: table 14+15 | |
| in case of short-circuit: table 17 | |
| short-circuit duration max 5s | |

## Application

Cables for special applications, e.g. as a single-core railway traction current cable for direct current and alternating current. Also as a return current cable in direct current systems up to 0.6/1 KV. Preferably for connections in overhead lines and rails, for laying in pipe conduits and trough channels and directly in the ground.

The regulations and standards of the transport services apply for the selection of railway traction current cables.

## Type Designation Codes

| | |
|---|---|
| **N** | cables acc. to standard |
| **(N)** | cables based on standard |
| **Y** | insulation made of polyvinyl chloride (PVC) |
| **S** | screen made of copper |
| **Y** | outer sheath made of polyvinyl chloride (PVC) |
| **v** | outer sheath reinforced |
| **RM** | circular conductor, stranded |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- NYSY from 1x50... to 1x400...

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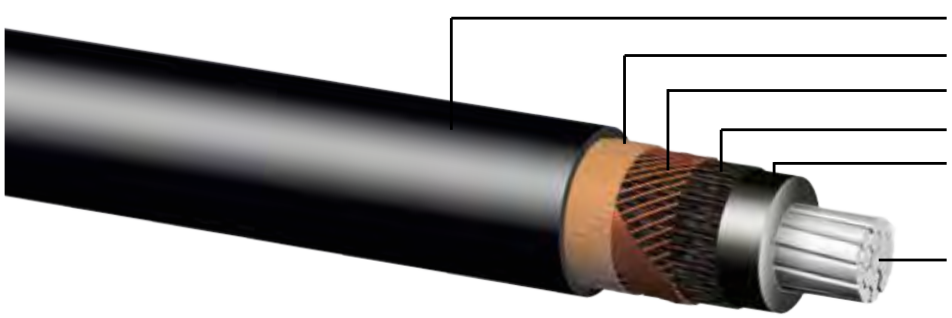
Edition: 05/2016

# BayEnergy® Railway power cables - 1 kV

## NA2XS... - stranded aluminium conductor, XLPE-insulated, screened

acc. to, resp. based on DIN VDE 0271

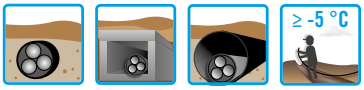


Outer sheath: PE, black
Natron-creppe
Helix made of copper, copper screen
Swelling fleece
XLPE core insulation

Stranded aluminium conductor

100% RoHS 100% REACH

similar to the illustration




**Optional:**


## Standards

DIN VDE 0271.
The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.
They are free of silicone, cadmium and free from substances harmful to the wetting properties of lacquers.

Cables with PVC sheath are flame retardant and self-extinguishing according to DIN EN 50265-2-1 (IEC 60332-1).

Cables with PE sheath are UV-resistant, however not flame retardant.

## Technical Data

| | |
|---|---|
| Rated voltage kV | 0,6/1 |
| Testing voltage kV | 4 |
| Cable temperature °C | |
| during laying (min) | -5 |
| cables with PVC sheath | -20 |
| cables with PE sheath | +90 |
| after laying (max) | |
| Max permissible operating temperature (conductor) °C | +90 |
| Short-circuit temperature °C | +250 |
| Current carrying capacity | |
| acc. to HD 603 S1-1994 5G | |
| during regular operation: table 14+15 | |
| in case of short-circuit: table 17 | |
| short-circuit duration max 5s | |

## Application

Cables for special applications, e.g. as a single core railway traction current cable for direct current and alternating current. Also as a return current cable in direct current systems up to 0.6/1 KV.

Preferably for connections in overhead lines and rails, for laying in pipe conduits and trough channels and directly in the ground.

The regulations and standards of the transport services apply for the selection of railway traction current cables.

## Type Designation Codes

| | |
|---|---|
| **N** | cables acc. to standard |
| **(N)** | cables based on standard |
| **A** | conductor made of aluminium |
| **2X** | insulation made of cross-linked polyethylene (XLPE) |
| **S** | screen made of cooper |
| **(F)** | longitudinally watertight in the screen section |
| **Y** | outer sheath made of polyvinyl chloride (PVC) |
| **2Y** | outer sheath made of polyethylene (PE) |
| **RM** | circular conductor, stranded |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- NA2XSY from 1x150 to 1x500
- NA2XS2Y from 1x150 to 1x500
- NA2XS(F)2Y from 1x120 to 1x500

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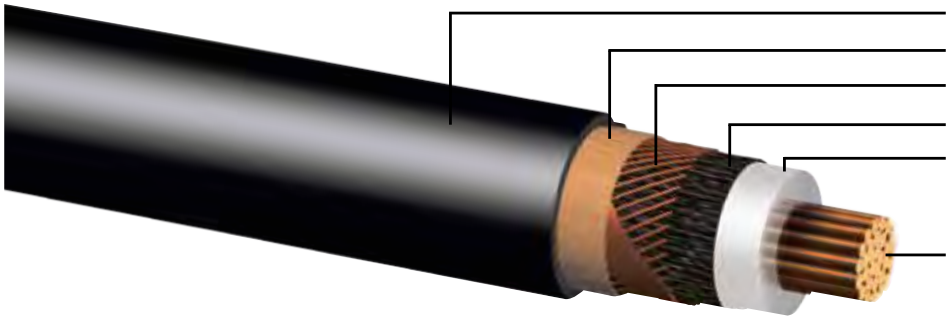
Edition: 05/2016

# BayEnergy® Railway power cables - 3-6 kV

## N2XS... - stranded copper conductor, XLPE-insulated, screened

acc. to, resp. based on DIN VDE 0271



Outer sheath: PE, black
Wrapping
Copper screen
Plastic tape, resp. swellable tape
XLPE core insulation

Stranded copper conductor

100% RoHS 100% REACH

similar to the illustration


**Optional:**


## Standards

Based on DIN VDE 0271.
The cables are in compliance with RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.
The cables are free of silicone, cadmium and free from substances harmful to the wetting properties of lacquers.

## Technical Data

| | |
|---|---|
| Rated voltage kV | 1,8/3 |
| Testing voltage kV | 7 |
| Cable temperature °C | |
| during laying (min) | -5 |
| after laying C | +90 |
| Max permissible operating temperature (conductor) °C | +90 |
| Short-circuit temperature °C | +250 |
| Current carrying capacity | |
| acc. to HD 603 S1-1994 5G | |
| during regular operation: table 14+15 | |
| in case of short-circuit: table 17 | |
| short-circuit duration max 5s | |

## Application

Cables for special applications, e.g. as a single-core railway traction current cable for direct current and alternating current. Also as a return current cable in direct current systems up to 1.8/3 kV.

Preferably for connections in overhead lines and rails, for laying in pipe conduits and trough channels and directly in the ground.

The regulations and standards of the transport services apply for the selection of railway traction current cables.

Railway traction current cables with PVC sheath upon enquiry.

## Type Designation Codes

| | |
|---|---|
| **N** | cables acc. to standard |
| **2X** | insulation made of cross-linked polyethylene (XLPE) |
| **S** | screen made of copper |
| **(F)** | longitudinally watertight in the screen section |
| **Y** | outer sheath made of polyvinyl chloride (PVC) |
| **2Y** | outer sheath made of polyethylene (PE) |
| **RM** | circular conductor, stranded |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- (N)2XS2Y 1x400
- (N)2XS(F)2Y from 1x240 to 1x500

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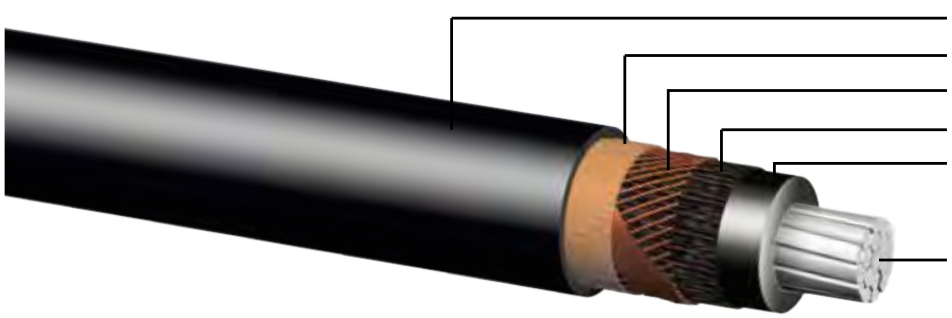
Edition: 05/2016

# BayEnergy® Railway power cables - 3-6 kV

## NA2XS... - stranded aluminium conductor, XLPE-insulated, screened, halogenfree

acc. to, resp. based on DIN VDE 0271



Outer sheath: PE, black
Natron-creppe
Helix made of copper, copper screen
Swelling fleece
XLPE core insulation

Stranded aluminium conductor

100% RoHS 100% REACH

similar to the illustration


Optional:


## Standards

Based on DIN VDE 0271,
low gas corrosivity acc. to EN 50267,
low toxicity of gases acc. to DIN EN 50305,
low smoke density acc. to DIN EN 61034-2,
flame retardant acc. to IEC 60332-3, EN 50266-2-4.

The cables are in compliance with RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.
The cables are free of silicone, cadmium and free from substances harmful to the wetting properties of lacquers.
The cables are halogen-free, fire retardant and low-smoke.
(FRNC - flame retardant, non corrosive, LSOH - low smoke, zero halogen).

## Technical Data

| | |
|---|---|
| Rated voltage kV | 1,8/3 |
| Testing voltage kV | 7 |
| Cable temperature °C | |
| during laying (min) | -5 |
| after laying (max) | +90 |
| Max permissible operating temperature (conductor) °C | +90 |
| Short-circuit temperature °C | +250 |
| Current carrying capacity | |
| acc. to HD 603 S1-1994 | |
| during regular operation: B1 | |
| in case of short-circuit: B2 | |
| short-circuit duration max 5s | |

## Application

Cables for special applications, e.g. as a single-core railway traction current cable for direct current and alternating current. Also as a return current cable in direct current systems up to 1.8/3 kV.

Preferably for connections in overhead lines and rails, for laying in pipe conduits and trough channels, however not directly in the ground.

The regulations and standards of the transport services apply for the selection of railway traction current cables.

## Type Designation Codes

| | |
|---|---|
| **N** | cables acc. to standard |
| **(N)** | cables based on standard |
| **A** | conductor made of aluminium |
| **Y** | insulation made of polyvinyl chloride (PVC) |
| **2X** | insulation made of cross-linked polyethylene (XLPE) |
| **S** | screen made of copper |
| **(F)** | longitudinally watertight in the screen section |
| **H** | outer sheath made of halogen-free polymer |
| **RM** | circular conductor, stranded |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- (N)2XSH 1x500
- (N)2XS(F)H from 1x240 to 1x500

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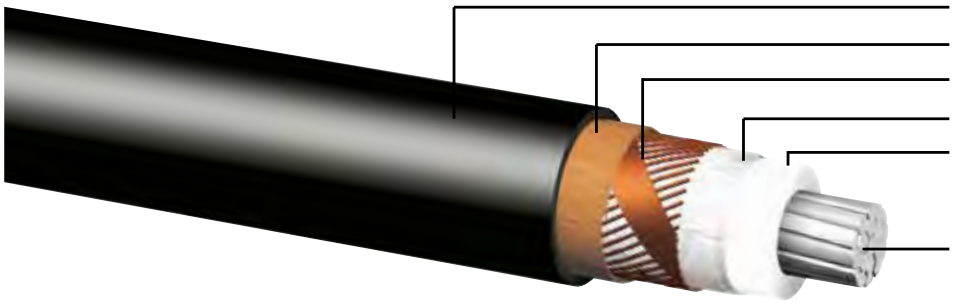
Edition: 05/2016

# BayEnergy® Railway power cables - 3-6 kV

## NA2XS... - stranded aluminium conductor, XLPE-insulated, screened

acc. to, resp. based on DIN VDE 0271

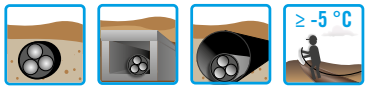


Outer sheath: PE, black
Wrapping
Copper screen
Plastic tape, swellable tape
XLPE core insulation

Stranded aluminium conductor

100% RoHS 100% REACH

similar to the illustration




**Optional:**


## Standards

Based on DIN VDE 0271.
The cables are in compliance with EU LVD (Low Voltage Directive) and RoHS Directive EU 2002/65/EC - RoHS 2.0 and Regulation No. 1907/2006 (REACH), dated 20.06.2013.

They are free of silicone, cadmium and free from substances harmful to the wetting properties of lacquers.

Cables with PVC sheath are flame retardant and self-extinguishing according to DIN EN 50265-2-1 (IEC 60332-1).
Cables with PE sheath are UV-resistant, however not flame retardant.

## Technical Data

| | |
|---|---|
| Rated voltage kV | 1,8/3 |
| Testing voltage kV | 7 |
| Cable temperature °C | |
| during laying (min): | -5 |
| cables with PVC sheath | -20 |
| cables with PE sheath | +90 |
| after laying (max) | |
| Max permissible operating temperature (conductor) °C | +90 |
| Short-circuit temperature °C | +250 |
| Current carrying capacity | |
| acc. to HD 603 S1-1994 5G | |
| during regular operation: table 14+15 | |
| in case of short-circuit: table 17 | |
| short-circuit duration max 5s | |

## Application

Cables for special applications, e.g. as a single core railway traction current cable for direct current and alternating current. Also as a return current cable in direct current systems up to 1.8/3 kV.

Preferably for connections in overhead lines and rails, for laying in pipe conduits and trough channels and directly in the ground.

The regulations and standards of the transport services apply for the selection of railway traction current cables.

## Type Designation Codes

| | |
|---|---|
| **N** | cables acc. to standard |
| **(N)** | cables based on standard |
| **A** | conductor made of aluminium |
| **2X** | insulation made of cross-linked polyethylene (XLPE) |
| **S** | screen made of cooper |
| **(F)** | longitudinally watertight in the screen section |
| **Y** | outer sheath made of polyvinyl chloride (PVC) |
| **2Y** | outer sheath made of polyethylene (PE) |
| **RM** | circular conductor, stranded |

## Special Designs

- Design according to national and international standards
- Design according to customer specifications
- Design with limited tolerance of outer diameter on request

## Product range

- (N)A2XSY from 1x240 to 1x500
- (N)A2XS2Y from 1x240 to 1x500
- (N)A2XS(F)2Y from 1x240 to 1x500

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Edition: 05/2016

# TYPE DESIGNATION CODES POWER CABLES

Power cables with plastic insulation and plastic sheath according to DIN VDE 0262, DIN VDE 0263, DIN VDE 0265, DIN VDE 0266, DIN VDE 0267, DIN VDE 0271, DIN VDE 0273 and DIN VDE 0276 part 603, 604, 620, 622, 626

**For cables with plastic insulation and plastic sheath the following designation codes are used (starting with the conductor):**

| | |
|---|---|
| **N -** | Cables acc. to standard |
| **A -** | Aluminum conductor |
| **Y -** | Insulation of polyvinyl chloride (PVC) |
| **2Y -** | Insulation of thermoplastic polyethylene (PE) |
| **X -** | Insulation of cross-linked polyvinyl chloride (XPVC) |
| **2X -** | Insulation of cross-linked polyethylene (XLPE) |
| **H -** | Field limiting conductive layers over the conductor and over the Insulation |
| **HX -** | Insulation of cross-linked halogen-free polymer blend |
| **C -** | Concentric conductor of copper |
| **CW -** | Concentric conductor of copper, waveform (ceander) |
| **CE -** | Concentric conductor in multi-core cables on each individual core |
| **S -** | Braided copper |
| **SE -** | For multicore cables field limiting conductive layers over the conductor and the insulation and copper screen over each individual core (indicated by „H“ is omitted here) |
| **F -** | Overhead line cable (DIN VDE 0276) |
| **F -** | Armouring of galvanized flat steel wire |
| **FE -** | insulation sustaining |
| **(F) -** | Longitudinally watertight cable (screen) |
| **B -** | Steel tape armouring |
| **R -** | Armouring of galvanized round steel wires |
| **G -** | Helix of galvanized steel tape |
| **HX -** | Sheath of cross-linked halogen-free polymer blend |
| **Y -** | Inner sheath of polyvinylchloride (PVC) |
| **Y -** | Outer sheath of polyvinylchloride (PVC) |
| **2Y -** | Outer sheath of polyethylene (PE) |
| **1Y -** | Outer sheath of polyurethane (PUR) |

**Conductor cross-section, shape and structure**

| | |
|---|---|
| **R -** | Circular conductor |
| **S -** | Sector shaped conductor |
| **E -** | Solid conductor |
| **M -** | Stranded conductor |
| **RE -** | Circular conductor, solid |
| **RM -** | Circular conductor, stranded |
| **SE -** | Sector shaped conductor, solid |
| **SM -** | Sector shaped conductor, stranded |
| **OM -** | Oval shaped conductor, stranded |
| **H -** | Waveguide |
| **/V -** | Compacted conductor |

**Use the QR-Code to find the Type designation codes online:**

# TYPE DESIGNATION CODES TELECOMMUNICATION

The number of conductors or pairs are marked with numbers. After the digits marking the stranded elements follows. The first letter of the type designation indicates the cable type or the application.

| | |
|---|---|
| **A** | Outdoor cable |
| **AB** | Outdoor cable with lightning protection requirements |
| **AJ** | Outdoor cable with induction protection requirements |
| **G** | Mine cable |
| **GJ** | Mine cable with induction protection requirements |
| **J** | Installation cable |
| **JE** | Installation cable for industrial electronics |
| **L** | Hose cable for telecommunication systems. Cables with stranded conductors for increased mechanical stress for telecommunication systems |
| **S** | Switch board cable for tele-communication systems |
| **P** | Insulation made of paper |
| **Y** | Insulation or sheath or protective sheath made of polyvinylchloride (PVC) |
| **Yv** | Reinforced protective sheath made of polyvinylchloride (PVC) |
| **2Y** | Insulation of solid PE or sheath or protective sheath made of polyethylene (PE) |
| **2Yv** | Reinforced protective sheath made of polyethylene (PE) |
| **02Y** | Insulation made of foamed polyethylene (PE) |
| **02YS** | Insulation made of foam-skin |
| **3Y** | Insulation made of styroflex |
| **4Y** | Insulation made of polyamide (PA) |
| **5Y** | Insulation made of polytetrafluoro-ethylene (PTFE) |
| **6Y** | Insulation made of perflourethylen-propylen (FEP) |
| **7Y** | Insulation made of ethylene tetrafluoroethylene (ETFE) |
| **9Y** | Insulation made of polypropylene (PP) |
| **09YS** | Insulation made of polypropylene foam-skin |
| **H** | Insulation or sheath made of halogen free material |
| **FE** | Cable with insulation integrity |
| **M** | Lead sheath |
| **Mz** | Annealed lead sheath |
| **C** | Screen made of copper braid |
| **(C)** | Individually screend pairs (copper braid) |
| **(K)** | Screen made of copper tape |
| **L** | Aluminum sheath |
| **LD** | Corrugated aluminum sheath |
| **(L)2Y** | Al-laminated sheath made of poly-ethylene, PE |
| **F** | Cable core with jelly filling |
| **TF** | Cable core with swellable tape |
| **W** | Corugated steel tape sheath |
| **D** | Screen made of round copper wires |
| **B*)** | Armouring |
| **C*)** | Protective sheath of jute and viscous compound |
| **Q** | Armouring made of steel braid |
| **(St)** | Screen (metal tape or plastic laminated metal tape) |
| **(Z)** | Steel wire braid over the inner PVC sheath |
| **E** | Compound layer with embedded plastic tape |
| **T** | Strength members |
| **(Zg)** | Strength members of bundled fiberglass yarns in or under the sheath |
| **Bd** | Stranded in bundles |
| **DM** | Multiple twin quad |
| **Lg** | Lagenverseilung |
| **F** | Star quad in the railway communica-tions cables |
| **St** | Star quad with phantom circuit |
| **St I** | Star quad in district cables (trunk cable) |
| **St III** | Star quad in local cables |
| **St VI** | Star quad HF suitable up to 4 MHz |
| **St VII** | Star quad HF suitable up to 16 MHz |
| **St VIII** | Star quad HF suitable up to 32 MHz |
| **PiMF** | Shielded pair (pairs in metal foil) |
| **S** | Railway signalling cable |
| **TF** | Star quad for carrier frequency technology |

[1] Tensile load valid only at participation cable sheath and cable core

[2] The bending radius for multiple bending applies to the radius of switching mechanism

Modifications and mistakes reserved. Other cable types and versions on request!

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# TYPE DESIGNATION CODES FIBRE OPTIC

| A- | | D | | Q | (ZN)2Y | 12x12 | E | 9/ | 125 | 0,36 | F | 3,5 | LG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |

**1**

**A** - outdoor cable,
**J** - indoor cable,
**AT** - outdoor cable, divisible,
**U** - universal cable for outdoor and indooruse (also as A/J)

**2**

**(ZS)** - metallic support element/ strength member

**3**

**V** - tight buffered fibre
**W** - loose tube with 1 fibre, filled
**D** - loose tube, filled
**E** - loose tube, flexible

**4**

**S** - metallic core/pair/quad

**5** **Filling** of the cable core

**F** - petrojelly
**OF** - special jelly
**Q** - swellable tapes

**6** **Cable sheath**

**Y** - PVC
**H** - flame retardant
**2Y** - PE
**4Y** - PA
**11Y** - PUR
**(L)2Y** - Al-laminated sheath
**(SR)2Y** - corrugated steel tape armouring and PE- sheath
**(ZN)2Y** - non-metallic strength members and PE-sheath
**(ZN)(L)2Y** - non-metallic strength members and PE-sheath Al-laminated sheath
**(ZN)(SR)2Y** - non-metallic strength members, corrugated steel tape armouring and PE- sheath

**7**

**...x** Number of cores with a fiber in loose tube cables
**x...** Number of loose tubes x number of fibers per loose tube in loose tube cables

**8** Type

**E** - single-mode fiber,
**G** - Graded-index fibre

**9**

**Ø** Fiber core diameter fiber in microns for multi-mode
**Ø** field diameter in microns in single-mode fibers

**10**

**Ø** Fiber cladding diameter in microns

**11**

Attenuation coefficient in dB / km

**12** Wavelength

**B** - 850nm
**F** - 1300nm at G, 1310 e
**H** - 1550nm

**13**

Bandwidth at G, dispersion coefficient in single-mode fibers

**14**

**LG** - layering
**SZ** - SZ stranding

## PICTOGRAMS


**Direct burial**


**Laying in ducts**


**Blowing in ducts and pipes**


**Laying in trays**


**Outdoor**


**Laying in water**


**Aerial cable, self supporting**

**Inhouse**

**Particularly rugged**


**Rodent protected**

**Screened**

**Temperature at laying**

**Theft-defence**

**Halogen-free**


**Flame retardant**


**Low smoke**


**Longitudinally watertight**


**Transversally watertight**

**Oil-resitant**


**Acid-resitant**

**Particularly flexible**


**Limited UV-resitant**

**Abrasion-proof**


**Rail foot**

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# CODE OF CONDUCT: BAYKA - BAYERISCHE KABELWERKE AG

## Preamble

Bayka and its member companies affirm their Corporate Social Responsibility as a part of their global business activities (internationally known as "CSR" 1). "Bayka's Code of Conduct for Corporate Social Responsibility" (hereinafter called "CoC") acts as a guideline in the industry, especially regarding working conditions, social and environmental compatibility, transparency, collaboration and dialog that is marked by trust. Developed and agreed to by Bayka and its member companies, the content of this CoC is an expression of Bayka's collective core values as they are defined in Bayka's vision and mission statements and especially as they are affirmed in the social market economy.

Bayka recommends that this CoC be implemented by the member companies. It is designed as a self-imposed obligation that can be signed by the member companies. By providing this CoC, Bayka assists them in responding to different general conditions in a global market and in facing challenges and social expectations that come from intensified collaboration from within the value chain.

## 1. Basic Understanding of Social Responsibility in Corporate Management

A mutual, basic understanding of social responsibility in corporate management forms the basis of this CoC. This means the undersigned company assumes responsibility by bearing in mind the consequences of its business decisions and actions on economic, technological, social and environmental levels and brings about an appropriate balance of interests. The undersigned company voluntarily contributes to the well being and longterm development of a global society at every point it can at the locations where it is in business. It is geared towards universally held ethical values and principals, especially integrity, honesty and respect of human dignity.

## 2. Where the CoC applies

**2.1** This CoC is in effect for all of the undersigned company's branches and business units worldwide.
**2.2** The undersigned company commits to promoting adherence to the content of this CoC at every point it can for its suppliers and in other parts of the value chain.

## 3. Core Values for Social Responsibility in Corporate Management

The undersigned company will proactively work to ensure that the values mentioned below are put into practice and adhered to both now and in the future.

### 3.1 Adherence to Laws

The undersigned company will abide by the laws in effect and other legal requirements of the countries where it is in business. For countries that have a weak institutional framework, the company will carefully examine what good company practices from their home country should be applied to enable supportive, responsible company management.

### 3.2 Integrity and Organizational Governance

**3.2.1** The undersigned company gears its activities towards universally held ethical values and principals, especially integrity, honesty, respect of human dignity, openness and non-discrimination based on religion, ideology, gender and ethnicity.
**3.2.2** The undersigned company rejects corruption and bribery as stated in the relevant UN Convention 2). It uses suitable means to promote transparency, trading with integrity, responsible leadership and company accountability.
**3.2.3** The undersigned company pursues clean and recognized business practices and fair competition. In regards to competition, it focuses on professional behavior and high standards of quality for work. It fosters partnership and trusting interaction with the supervisory authorities. Additionally, it will hold to the parameters of the "Guide for our Association Activity – Instructions for Compliance with Competition Law in the Bayka".

### 3.3 Consumer Interests

To the extent consumer interests are affected, the undersigned company abides by regulations that protect the consumer, as well as appropriate sales, marketing and information practices. Groups that are in special need of protection (e.g. protection of minors) will receive special attention.

### 3.4 Communication

The undersigned company will communicate in an open way and is oriented towards dialogue about the requirements of this CoC and about its implementation among employees, clients, suppliers and other stakeholders. Every document and all information will be duly produced. They will not be unfairly changed or destroyed. They will be properly stored. Company secrets and partner's business information will be handled sensitively and will be kept in confidence.

### 3.5 Human Rights

The undersigned company is committed to promote human rights. It respects human rights stated in the Charter of the United Nations 3), especially those named in the following:

**3.5.1 Privacy**
Protection of privacy.
**3.5.2 Health and Safety**
Ensuring health and work safety, especially the guarantee of a safe and health-promoting work environment, avoiding accidents and injuries.
**3.5.3 Harassment**
Employee protection against bodily punishment and against physical, sexual, psychological or verbal harassment or abuse.
**3.5.4 Freedom of Conscience**
Protection and guarantee of the right to freedom of conscience and freedom of expression.

### 3.6 Working Conditions

The undersigned company abides by the following core work standards from ILO 4):

**3.6.1 Child Labor**
The prohibition of child labor, i.e. the employment of persons younger than 15 years old, as long as the local legal requirements do not specify a higher age limit and as long as no exceptions are permitted 5).
**3.6.2 Forced Labor**
The prohibition of forced labor of any kind 6).
**3.6.3 Wage Compensation**
Work standards concerning compensation, especially in regards to the level of compensation as stated in the laws and requirements that are in force 7).
**3.6.4 Employee Rights**
Respecting the rights of the employee to freedom of association, freedom of assembly and collective bargaining, as long as this is legally permitted and possible in the respective country 8).
**3.6.5 Prohibition of Discrimination**
Treatment of all employees in a non-discriminatory fashion 9).

### 3.7 Hours of Work

The undersigned company abides by work standards concerning the longest permitted time of work.

### 3.8 Environmental Protection

The undersigned company fulfills the requirements and the standards for environmental protection that affect their operations and acts in an environmentally conscious way at all locations where it is in operation. For additional responsibility with natural resources, it holds to the principles from the Rio Declaration 10).

### 3.9 Civic Commitment

The undersigned company contributes to the social and economic development of the countries and regions where it is in business and promotes appropriate, volunteer activities by its employees.

## 4. Implementation and Application

The undersigned company will make every appropriate and reasonable effort to implement and to apply the principles and values described in this CoC both now and in the future. Contractual partners will be informed about the basic measures upon request and within the scope of a reciprocal cooperation, so that it becomes observable how keeping these measures is fundamentally guaranteed. No right exists to disseminate operational or business secrets related to competition or any other information that is in need of protection.

1) CSR = Corporate Social Responsibility
2) UN Convention against corruption in 2003, in force since 2005
3) General explanation of human rights, UN Resolution 217 A (III) of 1948
4) ILO = International Labour Organization
5) ILO Convention No. 138 of 1973 and ILO Convention No. 182 of 1999
6) ILO Convention No. 29 of 1930 and ILO Convention No. 105 of 1957
7) ILO Convention No. 100 of 1951
8) ILO Convention No. 87 of 1948 and ILO Convention No. 98 of 1949
9) ILO Convention No. 111 of 1958
10) The 27 principles from the "Rio Declaration on Environment and Development" of 1992 as the result from the UN Conference on Environment and Development in Rio de Janeiro


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Bayka since 1885

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