Caledonian

Caledonian Railway Cables

Railway Signalling Cable
Railway Communication Cables
Railway Power & Control Cable

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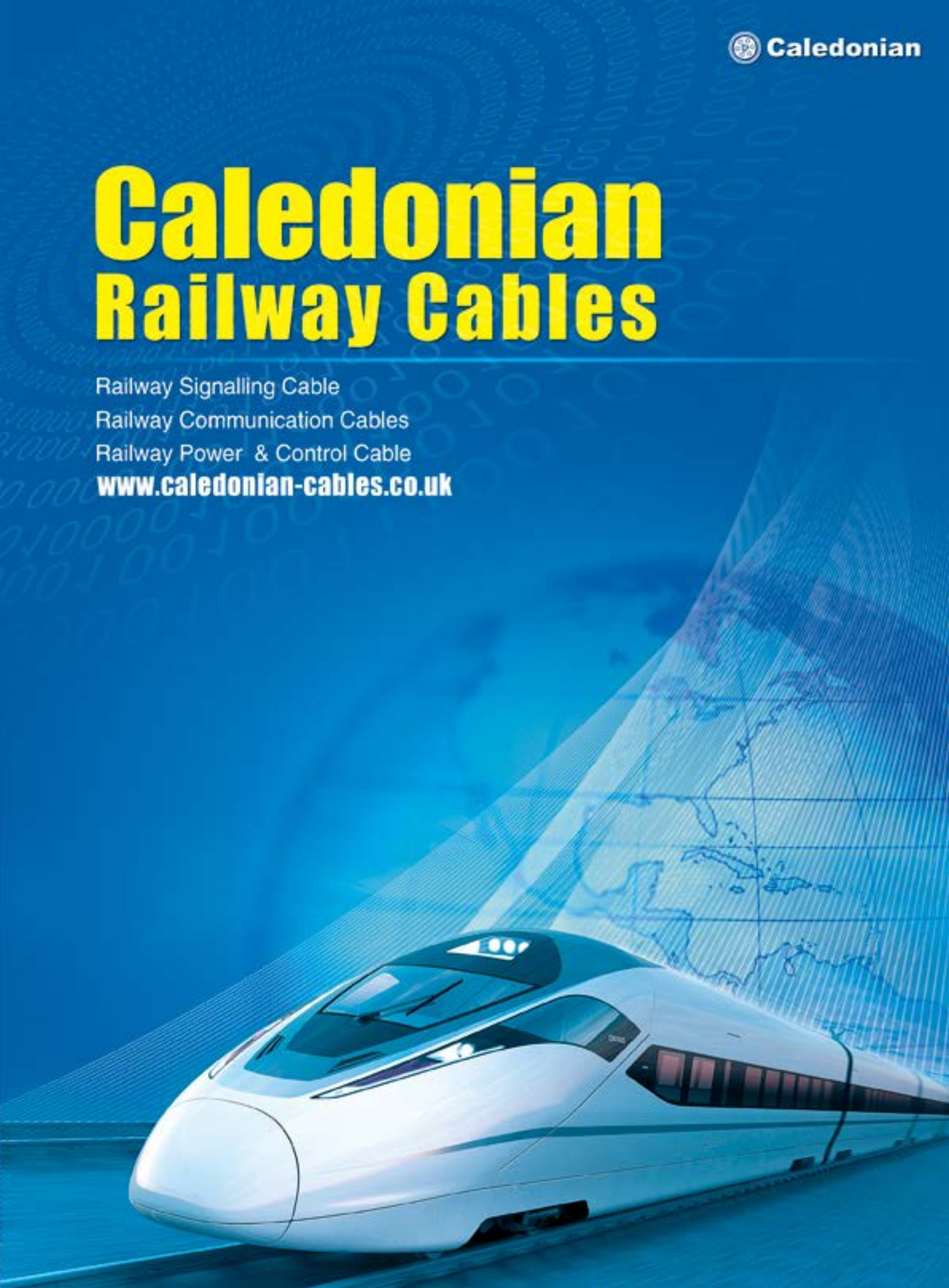


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European Signalling System for Rail Industry

Interoperability has become a keyword in the European Rail sector. It is easy to see there is an urgent need for a harmonized, interoperable train control system. At least seven proprietary ATP systems (Bombardier, Alstom, Invensys, Alcatel, Ansaldo/CSEE, Siemens /ZUB) were installed in European railway, creating a considerable barrier to Interoperability. A deep change in the communication and signalling system is taking place with the new ERTMS projects (European Rail Traffic Management System). Its purpose is to set up a common ATP/ATC System through Europe, allowing trains to cross borders easily and therefore increase the competitiveness of railways on international corridors for freight and passengers. The vision is to operate all high-speed lines and most other conventional lines through ERTMS/ETCS in Europe.

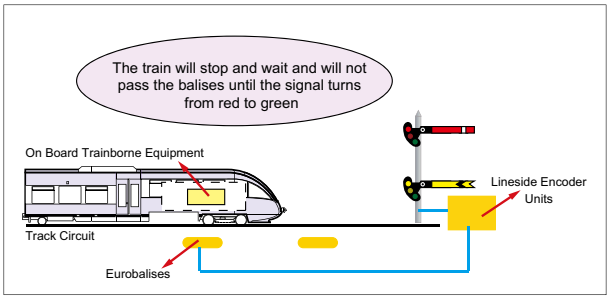
In the early days of ETCS development, Siemens and other signaling suppliers worked together within the EUROSIG group, which defined and specified the ETCS components to ensure compatibility and interoperability of the various sub-components and sub-systems. Siemens was the first to offer the S21 Eurobalise for commercial projects. German Rail (DB) has chosen the Berlin--Halle/Leipzig line as one of the European pilot lines for commercial operation at ETCS Level 2. The objectives of the pilot project are to demonstrate the interoperability of the system, employing components developed by various manufacturers. The line is equipped with conventional axle counters and lineside signals. For ETCS Level 2 operation, the line will have three radio block centres, each connected via LAN to the relevant electronic interlocking, and approximately 1000 S21 Eurobalises. Installation of GSM-R (Global System for Mobile Communications--Railways) has been successfully completed, covering the basic functionality of ETCS Level 2, such as movement authorisation.

The Signum system (Automatic Train Warning System –ATW) was the first in the Swiss Rail network to provide help or supervision to drivers. It significantly increased the safety with acoustic signals in cabins coupled with distance signals. However, this ATW system had no impact on network capacity. The French equivalent ATW system was the "crocodile" based on another technical concept, which of course was a problem to interoperability. When Swiss Federal Railways (SBB) introduced new signals in the 1990s, the ZUB system (Automatic Train Protection – ATP, with balises on the tracks) was introduced in order to launch emergency barking in case of exceeding specific needs. Such a system was mainly implemented in German speaking countries, whereas in France for example it was the KVB. At least 10 different ATW/ATP systems were then developed in Europe, creating a considerable barrier to Interoperability.

↘ What is ERTMS

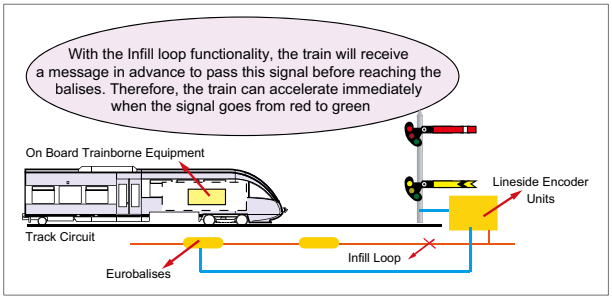
The European Rail Traffic Management System has been defined in 3 levels

R ERTMS Level 1:



A. Eurobalises

- Overlay to Existing Signalling System.
- Movement Authorities through Eurobalise.
- Train Integrity & Position by Track Circuit.

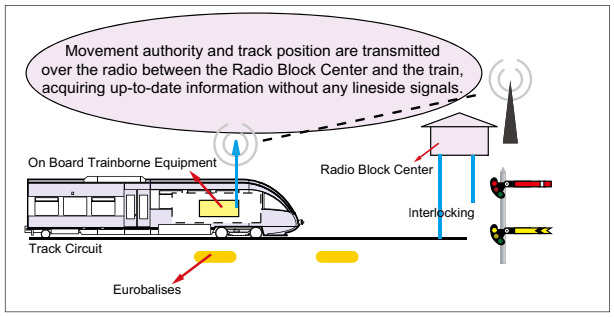


B. Eurobalises with infill (Euroloop or radio or extra balises)

- Overlay to Existing Signalling System.
- Movement Authorities through Eurobalise.
- Train Integrity & Position by Track Circuit.

ERTMS Level 1 is a Train Control System based on track-to-train communication by an intermittent system. The system includes Lineside Encoder Units (LEU) which is designed to acquire traffic information and convert this into conditioning messages to be sent to the balise for subsequent processing by the On Board equipment. Each LEU can command up to 4 balises. Each Encoder cabinet can house up to 8 LEUs. The maximum distance between balises is 5 km. Connection to Computer Based Interlocking is either through a safety protocol stack based on “Profibus”, or HDLC proprietary serial link. Purpose of the Eurobalise is to transmit a message to the On-Board equipment in order to advise the driver and the On-Board ATP processing unit about the train positioning and the conditions of the track and traffic ahead, and hence take the appropriate actions for train speed and for the protection of the train itself, passengers and infrastructure alike. LEUs and Eurobalises are linked through a suitable connection cable. The On Board equipment serves to calculate the dynamic speed profile, select the most restrictive speed value, compare the train’s actual speed with the permitted speed and, if necessary, perform brake application. Radio In-fill is a functionality that can be optionally added to the ERTMS Level 1 in order to increase the performance of the line. Purpose of the Radio Infill Unit is to transmit the message corresponding to the Eurobalise in advance with respect to the Eurobalise placed at the signal. In this way, a train approaching a signal at stop can revoke braking as soon as the signal clears without waiting to get to the signal itself. The In-fill message is transmitted via radio using GSM-R and Euroradio safety protocols, as in ERTMS Level 2. The use of radio allows a continuous infill coverage at unlimited distance from the signal.

R ERTMS Level 2: Eurobalises + Euroradio (GSM-R) + Radio Block Centre (RBC)



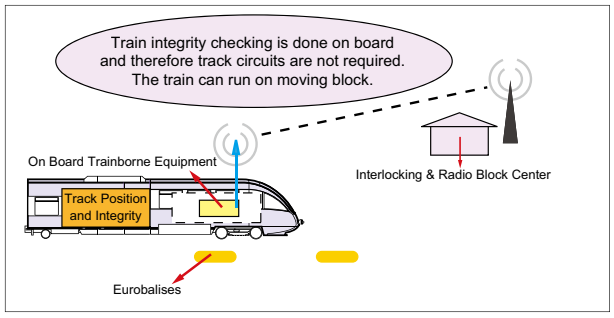
- No more Trackside Signals Required.
- Movement Authorities through GSM-R.
- Train Position via Eurobalise.

ERTMS Level 2 is a Train Control System based on data communications between the Centralized Block Centre and the trains, via a radio system. ETCS Level 2 brings the introduction of radio transmission for railway signalling i.e. GSM-R (Global Standard of Mobile Communication-Rail) in the frequency range of 900 MHz. In this case, the Eurobalise acts as intermittent transmission device, mainly for location reference. The Radio Block Centre (RBC) is wayside redundant management system designed to provide information continuously to each train and knows from trains their positions; it receives track circuits and route status information from the Automatic Block System and from Interlockings.

ETCS Level 2 combines many advantages as follows:

- Long term compatibility with other European railways by use of Eurobalise beacons;
- On-board signalling by use of radio transmission with the GSM-R protocol;
- Minimum amount of devices in the track, what reduce time and costs for track maintenance.

R ERTMS Level 3: Eurobalises + Euroradio (GSM-R) + Radio Block Centre (RBC)



- Movement Authorities through GSM-R.
- Train Position via Eurobalise.
- Train Integrity Onboard. Moving Block.

There are only a few players providing the very first High Speed Line in commercial service running solely on an ERTMS Level 2 system. Beside Europe, countries like China and India also embracing this advanced signalling system. Thousands of kms of ERTMS Level 1 lines are in operation or under construction also.

Electrification System for Rail Industry

The electric railway needs a power supply that the trains can access at all times. Transmission of power is always along the track by means of an overhead wire (catenary) or at ground level, using an extra, third rail laid close to the running rails. AC systems always use overhead wires, DC can use either an overhead wire or a third rail; both are common.

The railway electrification system supplies electrical energy to the trains at different voltages which include 600V DC, 750V DC, 1500V DC, 3000V DC, 15KV AC 16⅔Hz & 25KV AC 50Hz. The lower voltages are often used with third or fourth rail systems and voltages above 1000V are normally limited to overhead wiring for safety reasons. 750 volt DC third rail supply has been used extensively in UK for trains running up to 145 km/h, which is about its limit for speed.

25KV AC is the preferred system for high-speed and long distance railways, commonly adopted in Europe, India and United States. DC system is the preferred option for shorter lines, urban systems and tramways. 1500V DC is commonly used in Netherlands, Japan, India, France, New Zealand and United States, 3000V DC is commonly used in Belgium, Italy, Spain, Poland and south Africa.

While use of a third rail does not require the use of DC, in practice all third-rail systems use DC because it can carry 41% more power than an AC system operating at the same peak voltage. Third rail is more compact than overhead wires and can be used in smaller-diameter tunnels, an important factor for subway systems. DC systems are limited to relatively low voltages, and this can limit the size and speed of trains and the amount of air-conditioning the trains can provide. This may be a factor favoring overhead wires and high voltage AC, even for urban usage. In practice the top speed of trains on third-rail systems is limited to 100mph (160km/h) because above that speed reliable contact between the shoe and the rail cannot be maintained. Besides the third rail, fourth rail system may be adopted, as found in the London Underground. The additional rail carries the electrical return that on third rail and overhead networks is provided by the running rails. On the London Underground, a top contact third rail is beside the track, energized at +420V DC and a top contact fourth rail is located centrally between the running rails at -210V DC, which combine to provide a traction voltage of 630V DC.

Basic Design for Railway Cables

As a global supplier, Caledonian offers extensive range of copper and fiber cables in three key economic sectors: infrastructure, industry and building. Our cables are used in rolling stock, railway infrastructure, energy and telecom networks, automobiles, shipboard, oil, mining & petrochemical, windmill applications, etc. Caledonian has always been at the forefront of meeting the requirement of the most advanced railway standards within the ERTMS. The ERTMS requires high levels of EMC performance. Caledonian signaling and control cables are designed and built to comply with such EMC requirements, with the use of special insulation and sheath materials with different screening designs.

Caledonian designs a wide range of signaling and control (branded as RAILSIG), power (branded as RAILFEEDER), coaxial (branded as RAILCOX), fiber optic (branded as RAILOPTICS) and databus cables (branded as RAILDATA) specially adapted to rail environments, providing enhanced fire performance, oil resistance and flexibility. In rail sections including the station, trackside and tunnel, virtually all the cables have to be halogen free, as well as fire retardant, and assure low toxicity and minimal smoke to enhance survival, fire fighting and emergency operations.

Caledonian covers wide area network for main line, metropolitan area network for subway, light rail and intercity arrival/departures, and station range cable for efficient rail management. Caledonian can provides optic fiber for both analogue and digital railway applications such as (ESTMS/ETCS). Caledonian can also offer reliable cables to power the trackside equipments and provide low frequency communications.

Copper multicore, multipair and multiquads are used for signalling and control cables. Caledonian signalling and control cables guarantee electromagnetic immunity critical for communications from catenaries and current rail. They are designed to survive along the track, resistant to high temperatures, humidity, oil and ultra violet light. They have high dielectric strength, and come in Low smoke halogen free and fire retardant versions suitable for tunnels, stations and platforms. The cables can be customized to provide different reduction factor, special fire performance sheathing and specific color coding. Caledonian signalling and control cables exhibits exceptional performance because of special manufacturing process, choice of suitable insulation and sheathing materials for the rail environments.

Caledonian railway cables offer Rail authorities and operators, contractors a wide range of cable solutions, which may be one of the world′ s most comprehensive and technologically advanced answers to rail industry.

Caledonian has developed railway cables that meet the challenges posed by railway industry for low smoke and toxicity, even in a system that has the stringent requirement in the world. London Underground, a thriving railway system that carries a billion passengers in a year, also lay claim to be the oldest train system in the world. The first underground railway to operate electric train, it is usually referred to as a tube, thanks to the shape of the tunnel far below the street level. Built in late 1800s, the long tunnels were not designed for optimum fire safety. In fact, the long sections are designed without exits. As a result, if a fire began inside the tunnels, smoke and fumes will overwhelm the passengers, who would have no ready means of escape. Therefore, extreme precautions are taken to prevent the occurrences of fire smoke, fume and toxic vapor, which is one reason the system standard for smoke and toxicity is the most stringent of any rail systems in the world.

R Low smoke and fume, Low toxic and Oil resistant

The railway industry has the exact requirements for cables that are used in both infrastructure (the tunnels) and rolling stock (trains). These requirements cover underground train, tunnels, railways, subway, tram, trackside and mass rapid transit propulsion equipments. Safety is the critical issues. In fact, smoke and fume levels deemed safe are specified in different standard including BS 6853(UK), NFF 16101(France), DIN 5510 (Germany) and TS 45545-2(Europe).

Caledonian become aware of the market demand for a low smoke and fume, halogen free railway cables that would meet London Underground BS 6853 for low smoke and low toxicity, while also providing excellent resistance to mineral oil, withstanding IRM 903 for 7 days at 100 deg C.

R Flame retardant, UV resistant and temperature resistant

In addition to low smoke and toxicity in the event of fire, the cables are featured by

-Highly flame retardant

-No acid gas emission during fire

-Mineral oil resistence at high temperature (IRM 903 7 days at 100C)

-Wide operating temperature from -40degC to 120degC

-Weathering testing indicates 20-years UV resistance.

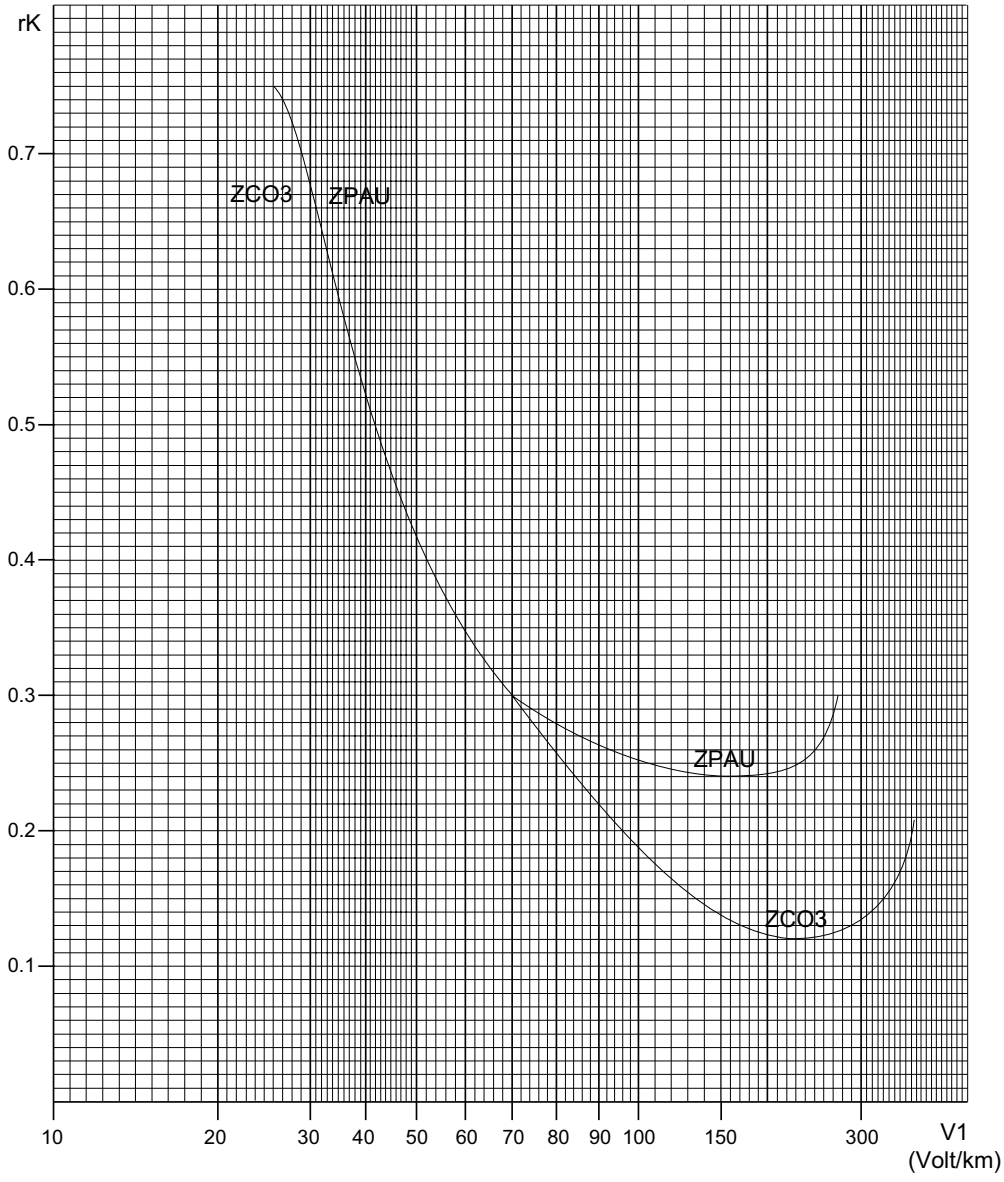
-Can be crosslinked via dry silane or e-beam technology to achieve high temperature resistance.

Caledonian railway cables can be designed to offer an extremely wide operating temperature range of +125℃ down to -60℃ , a very low smoke density and are always classified as short circuit cable and earth fault-proof cables

R Anti Induction for Railway Signalling & Control Cables

The magnetic field resulting from the power supply voltage of the catenaries (25KV A.C.) induces an electromotive force (e.m.f) in all conductors subjected to this field. If a conductor is protected by a conductive e metallic sheath, the e.m.f decreases from V1 to V2. The ratio rk = V2/V1 is called the screening or reduction factor. This screening or reduction factor is measured according to CCITT standard, requiring the cable sample of 2m length should achieve the required values for this rk factor as given in the table here below.

SCREENING FACTOR rK CURVES



ZPAU- Anti Induction Cables with two helically applied steel tapes (electromagnetic shield) and copper tapes (electrostatic shield)

ZCO3- Anti Induction Cables with two helically applied steel tapes (electromagnetic shield) and copper tapes (electrostatic shield)

In a theoretical and simplified way, this factor is equal to |R/Z|, R being the linear D.C. resistance of the metallic sheath and Z its linear impedance Z= r + jLω at the frequency ω/2π (generally 50Hz). The minimum value of the rk factor is obtained by decreasing R using screen with a high conductivity (such as copper) and by increasing L (and Z) choosing a screen with a high magnetic permeability (such as steel).

↘ Signalling & Control Cable to French Rail Standard

According to French rail, intercity Railway Signalling Cables rated 750V Railway signally cables are meant for signal circuits which link permanent installations situated along rail tracks. They are generally installed in conduits and meet the ST 698G (ZPGU-ZPAU Series) and CT 362 (ZCO3 Series) standard. They are multicore or multipair signaling and control cables providing low voltage energy and two way telecommunications for field equipment. The key features lie in the electromagnetic immunity with high reduction factor, especially for high speed lines.

R Unarmoured Local Link Cables (ZPGU Series)

The unarmoured ZPGU cables are used mainly on short distance links inside or outside the service cabins.

R Armoured Main Signalling Cables for non electrified lines or 1500V DC Lines (ZPFU Series)

The armoured ZPFU cables are used for the main circuits of 1500V DC electrified lines.

R Armoured Main Signalling Cables for 25KV AC electrified lines (ZPAU Series)

These cables are called "Anti induction cables" which are recommended for use in the main circuits of electrified lines in 25KV A.C. They are designed with improved protection against induction according to the following principle: when a telecommunication line is affected by electrical and magnetic fields resulting from the power supply voltage of the catenaries (25KV A.C.), there is an electromotive force induced between conductors and earth. The anti induction cables include several layers of metallic screens (copper and steel) to provide a very efficient protection against interferences.

R Armoured Main Signalling Cables for High Speed Train lines (ZCO3 Series)

The basic application of ZCO3 cables is for the carrier current signal system of high speed train line (TGV). Due to an increase in the induction screen thickness and the steel armor, their anti induction protection is much higher than the ZPAU Series cables.

R Equipment Cables for Control Centers (ZUG/SUG/ZUT, CV/CVZ & SCG Series)

ZUG/SUG/ZUT are equipment cables installed in traffic control centre or trackside equipment shelter, used for indoor interconnection between the computer devices and railway network equipment. ZUG & ZUT are multipair equipment cables and SUG are multicore equipment cables. CV/CVZ cables are used as cabling wires for the relays and electronic

equipment. The cables are suitable for use only in Optical Control Panel (OCP) wiring. The SCG cables are designed for connect the equipment centre to the device concerned. The cables are used as local control or power supply cables for trackside and between the rail equipments.

R K23 Cables

K23 are main armored LSZH multiquad signalling cables for metro local train and tramlines. They are designed for remote controls and teletransmissions in underground railway networks. The cables are used for digicode cable signaling, being laid in channel, cable tray, or on hook supports, along suburban railway lines, electrified at maximum 1500V DC. The cables have aluminium moisture barrier, double steel tape armour and LSZH sheath.

R K24 Cables

K24 are LSZH multipair signalling cables for metro local train and tramlines. They are designed for remote controls and teletransmissions in underground railway networks. The cables are used for digicode cable signalling, being laid in channel, cable tray, or on hook supports, along suburban railway lines, electrified at maximum 1500V DC u, b. K24 have aluminium moisture barrier and LSZH sheath, with optional double steel tape armouring,

R Digicode Cable

Digicode Cable are indoor railway signaling cables designed for transmission of track circuit digicode signals up to 30KHz in electrified lines, being installed in cable trays. The cables are covered by flame retardant LSZH sheath with double layers of steel tapes, with low capacitance values.

↘ Signalling & Control Cable to German Rail Standard

R AJ-2Y2YDB2Y

AJ-2Y2YDB2Y are multicore signaling cables designed for transmission of service tensions up to 600 VDC / 420 V_{eff} AC100Hz with induction protection. With the combination of copper wires and either 0.5mm or 0.8mm thick steel tape, the cables can be offered with different reduction factors (0.15, 0.35 and 0.55) and capacitance values (115, 145 & 95 nf/Km).

R A-2Y2YB2Y/A-2Y2Yv

The A-2Y2YB2Y and A-2Y2Yv cables are multicore signaling cables designed for transmission of service tensions for DC electrified lines without induction protection. These cables can be offered with different capacitance values (115, 145 & 95nf/Km). A-2Y2YB2Y cables are offered with one helically applied steel tape (0.2-0.3mm) or two helically applied steel tapes (0.1mm). A-2Y2Yv cables are unarmoured version.

R AJ-2Y(L)2YDB2Y

AJ-2Y(L)2YDB2Y are multipair signaling cables designed for AC electrified lines with induction protection, suitable for transmission of signals up to 90KHz in railway networks. With the combination of copper wires and either 0.5mm or 0.8mm thick steel tape, the cables can be offered with different reduction factors (0.15, 0.35 and 0.55) and low capacitance values of 45nF/km.

R A-2Y(L)2YB2Y/A-2Y(L)2Yv

A-2Y(L)2YB2Y & A-2Y(L)2Yv are multipair signaling cables designed for DC electrified lines without induction protection. These cables can be offered with low capacitance values of 45nF/km. A-2Y(L)2YB2Y are offered with one helically applied steel tape (0.2-0.3mm) or two helically applied steel tapes (0.1mm). A-2Y(L)2Yv cables are unarmoured version.

➘ Signalling & Control Cable to UK Network Rail Standard

Generally speaking, this type of internal and external single and multicore Signalling cable is used for the control of the UK rail signal network. The applicable standard is NR/PS/SIG/00005. These signalling cables are insulated with either LSZH or EPR compound and sheathed by either elastomeric LSZH or PCP sheath compound to make the cables become highly flexible for railtrack installation. Further, the cables are also oil resistant.

Caledonian's signalling cable types include Class 2 stranded A1, A2 and A3 with LSZH insulation; Class 2 stranded B1 and B2 with EPR insulation and HDPCP sheath; Class 5 stranded C1 and C2 with EPR insulation and high density PCP sheath; Class 2 stranded D1 and D2 with EPR or LSZH Insulation and LSZH sheath. Class 5 stranded E1 and E2 with EPR or LSZH insulation and LSZH sheath; and Class 5 stranded C3 with EPR insulation and E3 with LSZH insulation are protected with overall screening.

R Signalling cable type A1, A2, A3

LSZH cables for free wiring in relay rooms, signal boxes, REBs (Equipment Boxes) and location cases. All Type A Cables have Class 2 stranded tinned copper conductors with LSZH insulation. A1 and A2 Cables are single core cables and A3 Cables are multi-core. A1 Cables are with LSZH insulation only and A2 and A3 Cables also have an LSZH sheath.

R Signalling cable type B1, B2, D1 & D2

Type B and D Signalling Cables are used between Equipment Boxes, Signal Boxes, Relay Rooms and Location Case. Both B and D Cables have Class 2 stranded tinned copper conductors – B1 and D1 Cables are single core cables and B2 and D2 Cables are twin and multi-core cables. Whereas B1 and B2 Cables have EPR insulation and HDPCP sheathing, D1 and D2 Cables have LSZH or EPR insulation and LSZH sheathing.

R Signalling cable type C1, C2, E1 & E2

Type C and E Signalling Cables are designed to carry control and signal information between the Location Cases and the Signalling Head. Both C and E Cables have Class 5 stranded tinned copper conductors – C1 and E1 Cables are single core cables and C2 and E2 Cables are twin and multi-core cables. Whereas C1 and C2 Cables have EPR insulation and HDPCP sheathing, E1 and E2 Cables have LSZH or EPR insulation and LSZH sheathing. C2 and E2 Cables are commonly referred to as Tail Cables. C1 and E1 Cables are used for the maintenance of these installations.

R Signalling cable type C3 & E3

Type C3 & E3 cables are designed for use in the rail network' s TPWS (train protection warning system). These cables have two flexible cores with either EPR (C3 Cable) or LSZH (E3 Cable) insulation, a drain wire, and an aluminium screen.

Signalling & Control Cable to Spain Rail Standard

R EAPSP

EAPSP are multicore and multiquad signaling cables without induction protection, which can be installed directly to the ground. This is equivalent to A-2Y(L)2Y(SR)2Y according to VDE standard. The cables are equipped with moisture barrier and corrugated steel tape armouring.

R CCPSSP & CCTSST

CCPSSP & CCTSST are multicore, multipair or multiquad armoured signaling cables used for transmission of low frequency signals in high speed lines. Either copper wires or tapes are used to serve as electrostatic shield. With the combination of either copper tapes or wires and double layers of 0.8mm thick steel tape, the cables can offer either 0.1 (copper wire) or 0.3 (copper tape) reduction factor. CCPSSP is covered with PE sheath equivalent to AJ-2Y(St)2YB2Y according to VDE standard and CCTSST is covered with fire retardant non corrosive PE sheath, similar to AJ-2Y(St) HBH. The cables can be jelly filled to offer full watertightness.

Axle Counter Cables

Axle counters are track-side devices that detect the passing of a train in lieu of the more common track circuit. The axle counter monitor and count the number of train wheels passing by them. A counting head (or 'detection point') is installed at each end of the section, and as each axle passes the head at the start of the section, a counter increments. A detection point comprises two independent sensors, therefore the device can detect the direction of a train by the order in which the sensors are passed. As the train passes a similar counting head at the end of the section, the counter decrements. If the net count is evaluated as zero, the section is presumed to be clear for a second train.

Axle counter cables are used to connect the track-side axle counters, which are usually positioned at intervals of between 1 and 3km, to the central monitoring system for determining train presence, direction of travel and number of wagons. Axle counter cables are usually armoured, jelly filled, PE insulated and sheathed cables used for transmission of signals up to 90 kHz in axle counter train detection systems. The applicable standards are RT/E/PS/00031 and NR/L2/SIG/30060.

Axle Counter cables are characterized by low reduction factor and offer a high level of shielding against the electromagnetic interference (EMI) produced by high-voltage overhead catenaries and other power feeds.

Typically, the operating signals from the axle counters vary between 60 and 90V, and a key requirement for this very demanding safety-critical application is that the axle counter cable should offer a low voltage drop, with a loss of just a few volts over long lengths. This is significantly better than conventional signal cables. Further, Axle Counter cables give clear advantages in term of cable size and watertightness performance. The cables are compact in size and flexible enough to enable it to fit easily within the already crowded train axle counter systems.

Eurobalise Cables

Purpose of the Eurobalise is to transmit a message to the On-Board equipment in order to advise the driver and the On-Board ATP processing unit about the train positioning and the conditions of the track and traffic ahead, and hence

take the appropriate actions for train speed and for the protection of the train itself, passengers and infrastructure alike. The balise cables are used for the Eurobalise and the balise transmission modules in the On-Board equipment. The cables are flexible, resistant and have electromagnetic immunity for high frequency communications which is a necessity for a radio based GSM-R traffic management system.

These specialised balise cables are to be used in the upgrading of rail network to meet ERTMS (European Rail Traffic Management System) requirements. The implementation of ERTMS will facilitate higher-speed services and an increased number of connections on railways. The balise cables are advanced copper signalling cables which will be installed along the tracks to carry vital information regarding train position, length and number of wagons. This information will be used by the Automatic Train Control (ATC) system and relayed both to the driver via transponders, otherwise known as "balises", and to the train control centre. The balise cables therefore play a vital role in maintaining high levels of safety as the volume of rail traffic increases.

↘ Fire Resisting Signalling Cables

R K27 Fire Resisting Signalling Cables

K27 are multiconductor halogen free signaling cables, flame retardant according to NF F32-070, fire resistant according to CR1 CI French standard. The silicon rubber insulated cables are protected with double steel tapes, designed for suburban infrastructures and underground railways. The cables are used for carrying power control, signals and vital communication data during the time to evacuate the people at risk.

R MD4 Fire Resisting Signalling Cables

MD4 are multiconductor halogen free signaling cables, flame retardant according to NF F32-070, fire resistant according to CR1 CI French standard. The mica insulated cables are protected with double steel tapes and copper tapes to offer induction protection, designed for suburban infrastructures and underground railways. The cables are used for carrying power control, signals and vital communication data during the time to evacuate the people at risk.

↘ Twin Datalink Cables

These rail cables are PE or LSZH sheathed interconnecting cables suitable for Solid State Interlocking (SSI) systems, in either black or blue sheath. The applicable standard is BR1932 (PA05/02833).

↘ Telecom Cables for Outdoor Plant

R Trackside Telephone Cable

The trackside telephone cable, usually denoted by RT/ZHLS or A-2Y(L)2Y, are designed primarily for XDSL transmission in a LAN or access network. Trackside telephone cable are usually unit twin PE insulated jelly filled 0.63 or 0.9mm communication cables with either PE or LSZH sheath. The trackside telephone cables are installed in the cable troughs along the side of the track. The cables can be used to connect everything from stations and relay rooms to telephone points in location cases. The applicable standards are NR/PS/TEL/00015 (formerly RT/E/PS/00015 and GK/RT 0315) for UK Network Rail and TS0886/BS1822 & BR892 for UK Network Rail, SNCF CT 2328 /SNCF CT 2329 for

France RATP. For direct burial application, brass tape armouring or Zetabon type corrugated steel tape armouring can be offered against rodent attack.

R Metro Communications Cables

Two metro communications cables are usually employed within railway equipment rooms located in either open locations or within the tunnels/stations. One is LUL specification G7621 (type 1/non section 12) which is designed for installation in trackside bracket runs and for use within railway equipment rooms located in open locations. The other, the LUL specification G7622 (type 2/section 12) metro communications cable is designed for trackside bracket runs, and railway equipment rooms within subsurface tunnels and stations.

R Scada/Pilot Cables

The Scada/Pilot Cable are jelly filled 0.9mm multipair telephone cables complying with BS3573. These telecom cables are suitable for modem based Supervisory Control and Data Acquisition systems (SCADA) operating in the VF range 300 to 3000Hz. The SCADA system is radio-based and includes an integrated hardware/software system that monitors and alarms on the power distribution, escalator status, elevator status, security intrusion, fare collection intrusion, fire alarm etc.

The applicable standard is NR / PS / ELP / 27220 (formerly RT/E/PS/0034) for UK Network Rail.

R Trackside Fiber Cable

Trackside fiber cables are fibre communication cables designed to serve high traffic and data rate requirements and FTN applications. To meet the security concerns of tunnels and urban metro system, both metal armoured and all dielectric optic fiber cables with up to 144 fiber counts can be supplied, offering electromagnetic immunity within the rail network for systems with high traffic and data requirements. Trackside cables have a single mode fibre, single continuous non-metallic strength member, a water-blocking compound, fibre carrier, separator and a PE sheath. The armoured version usually has corrugated steel/polymer laminate tape for mechanical protection. Compact and cost-efficient optical fiber micro-cables are increasingly being installed in dense railway subway networks. The use of fiber yarns guarantee for both longitudinal water tightness and vibration reducing characteristics. The use of premium single mode fibres guarantees highest data rates and best transmission reliability. Other than corrugated armouring, the metal free all dielectric fiber optic cables can be glass armoured with rodent protection or reenforced with double sheath with buffer intermediate layer.

The applicable standards are NR/PS/TEL/00014 (formerly RT/E/PS/00014), BR 1837 and SCCF CT2242 (corrugated steel tape armoured) SNCF ST2513 (unarmoured).

R Radiating Cables

The radiating cables are another form of coaxial cables to provide a tuned bi-directional desired leakage effect between transmitter and receiver. The cables are often used in underground, tunnels where an antenna is impossible. These flexible perforated coaxial cables act like antenna in this confined environment. They are extremely important for ESTMS/ETCS radio based system.

↘ Telecom Cables for Indoor Plant

R Armoured F/FTP Cat6 LSZH Cables

Lan cables made up of 4 pair F/FTP Cat6 cables are used to ensure transmission of digital signals between stations and control centres, feeding information to and from ticket machines, barriers, clocks, display systems, lifts and escalators. Each pair of these cables are screened with individual aluminium foil, with overall aluminium foil screen. Other options include UTP (Unshielded), FTP (Overall aluminium foil screened), S/FTP (Individual aluminium foil screened with overall copper braid screen). The cables are suitable for installation in cable trays or on hooks. Galvanized steel braid armouring can be applied for rodent protection. The applicable standard is RATP Cat6-K20 for France RATP.

R Armoured Optic Fibre LSZH Cables

Using a fiber optic backbone, the communications system is well connected by fiber optic cables. The communication system includes public address (PA) systems, emergency telephones, centrally connected ticket kiosk, closed circuit television monitoring, and controlled and alarmed access points to the emergency walkways. The PA system also services the vehicles and the OMSF. The on-board system provides for announcements of the next station, door closing warnings, and any service interruptions, as well special announcements about special events, emergencies, and so on.

The cables are used for long distance telecommunication and signaling links using either single mode or multimode optical fibers in suburban infrastructure. These halogen free cables are laid on hooks, pulled through ducts or cables trays. The applicable standard is RATP K209A/B for France RATP. The cables can be applied with corrugated copolymer steel armouring for rodent protection.

R 50/75 Ohm LSZH Coaxial Cable

The video surveillance system within a station and between stations is made possible with coaxial cables. Analogue signals from CCTV cameras are transmitted by either 50 or 75 Ohmn coaxial cables. The 50 Ohm cables are HF transmission coaxial cables for GSM antennas. All radio-based communications transmits and receives information relayed through antennas located along the guideway. The 50 Ohm cables include: solid red copper; solid copper coated aluminium; red copper tube; corrugated red copper tube (for 1'5/8F type). The 75 Ohm cables are HF transmission coaxial cables. These include solid red copper (for type 11 RTC) used for video surveillance or red copper tube (for type KX6) used for cameras. The Halogen-free cables are suitable for being laid on hooks, and pulled through walls or through technical ducts. The applicable standard is RATP K26 for France RATP.

↘ Power & Control Cable for railway applications

R 650/750V Trackfeeder Cable

At a Substation, the AC current is transformed and rectified into DC 650/750V. Trackfeeder cables are used to take provide the 650/750 volt DC supply from Traction Substations and Track Paralleling Huts to the track including the conductor rails, negative cable connections and where appropriate bonding. The single core trackfeeder cable has a Class 2 stranded aluminium or tinned copper conductor, a PETP (Polyethylene Terephthalate) separator and a black

CSP sheath. Positive trackfeeder cables commonly used include 1x1000mm² (aluminium), 1x630mm² (copper) and 1x500 mm²(aluminium). Negative trackfeeder cables commonly used include 1x800mm² (aluminium), 1x500mm² (copper), 1x240mm² (aluminium), 1x161mm² (copper) & 1x150mm² (aluminium). The applicable standard is NR/PS/ELP/21101. BS6360 and BS6899 for UK Network rail and NF-F5525 for France RATP.

R 0.45/0.75KV LSZH Earthing Cable

Earthing cables, commonly named as LSZH 6491B conduit wiring cable, are used in switch and relay rooms, stations and general areas as required providing an effective protective earth. These cables are commonly installed in ducts and used in the power network within a station – from the ticket kiosks, passenger information displays, entrances and exits to the lifts and escalators. The applicable standards is BS7211 and EME-SP-14-026 for UK Network Rail.

R 0.6/1KV Steel Wire Armoured LSZH Cable

Steel wire armoured 0.6/1KV LSZH power and auxiliary control cables are designed for supply of power to ticket kiosks, passenger information displays, entrances and exits, lightning systems, lifts and escalators in the concourse. They can be installed directly underground, outdoors, indoors and in cable ducting. These cables have Class 2 stranded copper conductors, XLPE insulation and aluminium or steel wire armour. The applicable standard is BS6724 and EME-SP-14-027 for UK Network Rail. LSZH cables are employed for installation in the concourse where fire, smoke emission and toxic fumes may create a potential threat during the fire.

R Fire Integrity Cable

Fire Integrity Cable, are designed for installation typically in public help points (PHP), public address (PA), station announcement platforms (SAP), fire alarm and CCTV systems, platform screens and door, entrance and exits, lifts and escalators in a station where vital circuit integrity must be maintained in the event of a fire. The fire integrity cables also furnish a complete fire detection system for difficult environments (like tunnels) providing early warning and no false alarms. The fire integrity cables consist of solid or stranded copper conductors, silicon rubber insulation, an optional aluminium tape and a LSZH sheath. The applicable standards include BS7629-1, BS 5839-1:2002, BS 8434-1:2003, BS EN 50200 PH30, BS 6387 C W Z, IEC 60332-3, IEC 60332-1, BS EN 50265, BS EN 50266, BS 50267, BS EB 50268 , IEC 60754 and IEC 61034). These cables comply with LU Section 12 station regulations.

R Aluminum Power Cable

Aluminium power Cables are designed for the distribution of trackside signalling power. These 2 and 4 core power cables have a sector shaped solid aluminium conductor, XLPE or PVC insulation, a PETP separator and a black PVC sheath. The applicable standards are BR880, BS5467 and BS6346.

R Point Heating Cable

Swtichpoints along a railway line allow the train to change between tracks. Many railway switchpoints suffer during the winter months, from snow and ice blocking the moving rails and point mechanisms, causing failures and disruption to traffic. It is vital that these Points continue to operate effectively in adverse weather conditions. To do so, Switchpoint Heating system are installed in the web of the stock and moving rails and applies heat through point heating cable

effectively to the areas most prone to the effects of snow and ice. The point heating cables consist of Class 5 flexible tinned copper conductors, EPR (Ethylene Polypropylene Rubber) insulation and a PCP (Polychloroprene) sheath. These heavy duty cables offer protection from abrasion and mechanical impact whilst maintaining flexibility to ease installation and provide power and control in Points Heating systems. The applicable standard is NR/SP/ELP/40045 (formerly RT/E/PS40045) and BS7919

R Bare Conductor and Screening Conductor Cables

In overhead line networks, screening conductor cables are used to screen telecommunication cables from electrical interference caused by the potential of a high voltage cable. These cables can absorb the magnetic field generated by the overhead high voltage cables and minimize the effects of this interference. Bare and covered screening conductor cables are usually installed in parallel to the communication cable to provide effective zonal screening. The conductor section is usually 150mm sq and 240/250 mm sq. Screening Conductor Cable has a single core stranded aluminium conductor and a black PVC or LSZH sheath, and a Bare Conductor consists of a single core stranded aluminium conductor. Screening conductor cables are denoted as FTN screening conductor cables by Network Rail. The applicable standard is NR/PS/TEL/31102 (BR1817)/BS6485

R NSGAFOU Rail Cable

NSGAFOU cables are designed for use in wiring of devices in the electrical traction units that power the wheels and auxiliary controls (such as breaks and heating systems). NSGAFOU Rail Cable is a single core cable with a Class 5 flexible tinned copper conductor, EPR insulation, and a Black PCP sheath. These cables are used for existing train maintenance only.

R 6.35/11KV, 12.7/22KV & 19/33KV & 25/44KV Medium Voltage Cable

These medium voltage cables are designed for the distribution of three phase A.C. electrical power supplies at nominal system voltages of 11KV, 22KV 33KV and 44KV to traction substations on D.C. electrified lines. The 25KV two core concentric cables are mainly used to deliver 25KV single phase electrical power supplies, typically, to feeder stations on A.C. electrified lines. The 25KV single core cables are mainly used to carry 25KV electrical power supplies from track-side switching stations to the overhead line equipment on A.C electrified lines. Armoured 11kV cables are used to distribute power between substations. Over longer distances, 33KV cables are generally specified.

This 11-33kV cables have class 2 stranded plain aluminium or copper conductors, extruded semi-conducting XLPE conductor screen, XLPE insulation and cold strippable semi-conducting XLPE insulation screen, water blocking tape, metallic screen of copper wires and copper tapes, aluminium or steel wire armour and a PE, PVC or LSZH sheath. The applicable standard includes Network Rail Line Standard NR/PS/ELP/00008, BS6622 or BS7835 (LSZH version). These power cables are available in various sizes: popular sizes of 1x240mm² solid aluminium, 1x185mm² solid aluminium and 1x300mm² stranded copper are commonly used.

R DC Traction Cables for 1500 DC Electrified Lines

Most of the railways use a 1500VDC, single overhead conductor catenary system with traction return via the running rails. The traction power system provides 1500V DC power to the train through two power rails, a positive and negative, mounted to the side of the guide beam. The system provided for traction supply from substations connected to lines via fault sensing circuit breakers. Return current is collected by connecting the substation negative busbar to the rail, usually by way of impedance bond. DC traction cables are used to connect impedance bonds and negative busbar to rails and

between neutral points of the impedance bonds mounted in track. DC traction cables are designed for traction return for non electrical areas or electrified areas using 1500DC traction.

DC traction cables are used as positive and negative cables for railway system. Positive feeder cables connect the dc feeder circuit breakers in the traction substation to the contact rail system. Negative feeder cables are used to connect the rectifier negative bus in the traction substations to the shunts at the running rail.

In normal traction area, the standard size is 120mmsq copper. This may be provided by 608/0.5mm copper or 925/0.5mm (185 mmsq) aluminium. In heavy traction area, standard size is 185mmsq copper. This may be provided by 962/0.5mm copper or 1525/0.5mm (300mmsq) aluminium.

DC traction cables are characterized by superior aging and stable electrical characteristics at high temperature, extreme heat resistance and sunlight resistance, suitable for installation in damp locations inside the tunnels. They can be used for direct burial or in ducts, subject to vibrations of train operation.

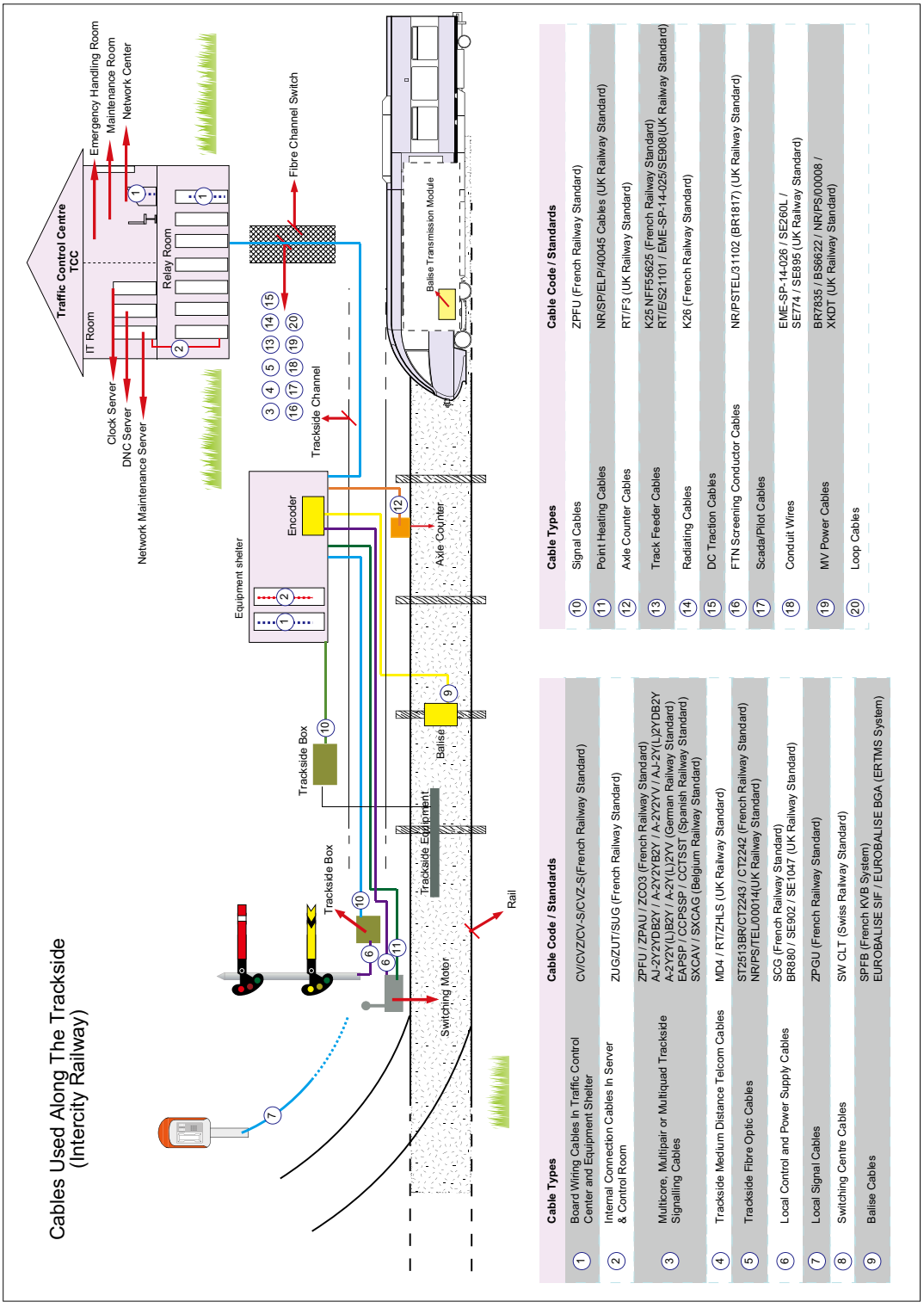
Conductor shall be anneal uncoated copper, concentric and round. An extruded semi conducting thermoset compound shall be applied over the conductor. This conductor shield is firmly bonded to the overlying insulation with a similar temperature coefficient of expansion as the EPR insulation. The EPR insulation can withstand oil, heat, stress and extreme temperature, being moisture, chemical resistant and mechanically rugged. The cables shall have at least 3.9mm or 155mil insulation thickness. The sheath shall be either crosslinked polyolefin low smoke zero halogen compound or CSP. The LSZH or CSP sheath applied with this cable provides excellent resistance to mechanical abuse, flame, weathering, most oils, acids and alkalines.

↘ Firerail Traction Cables for Railway Application

FIRERAIL traction cables series are compact single and multicore power and signal cables. They are designed to pass the fire tests relevant to railway applications. They have extremely low toxicity values and thanks to the thin wall and medium-wall design, weight and space requirements are minimized. They are halogen free, flame retardant, low smoke and have a low toxicity index. Demands for temperature, weathering, ozone and oil resistance are fulfilled easily. They are especially suited to electrical/diesel multiples units, railway vehicles, trams and underground railways, for connecting fixed and moving parts, open, in cable ducts or pipes, inside and outside railway vehicles, converters, traction motors and breaking system

Cables for Railway Application

Trackside Railway Cables (Intercity Railway)

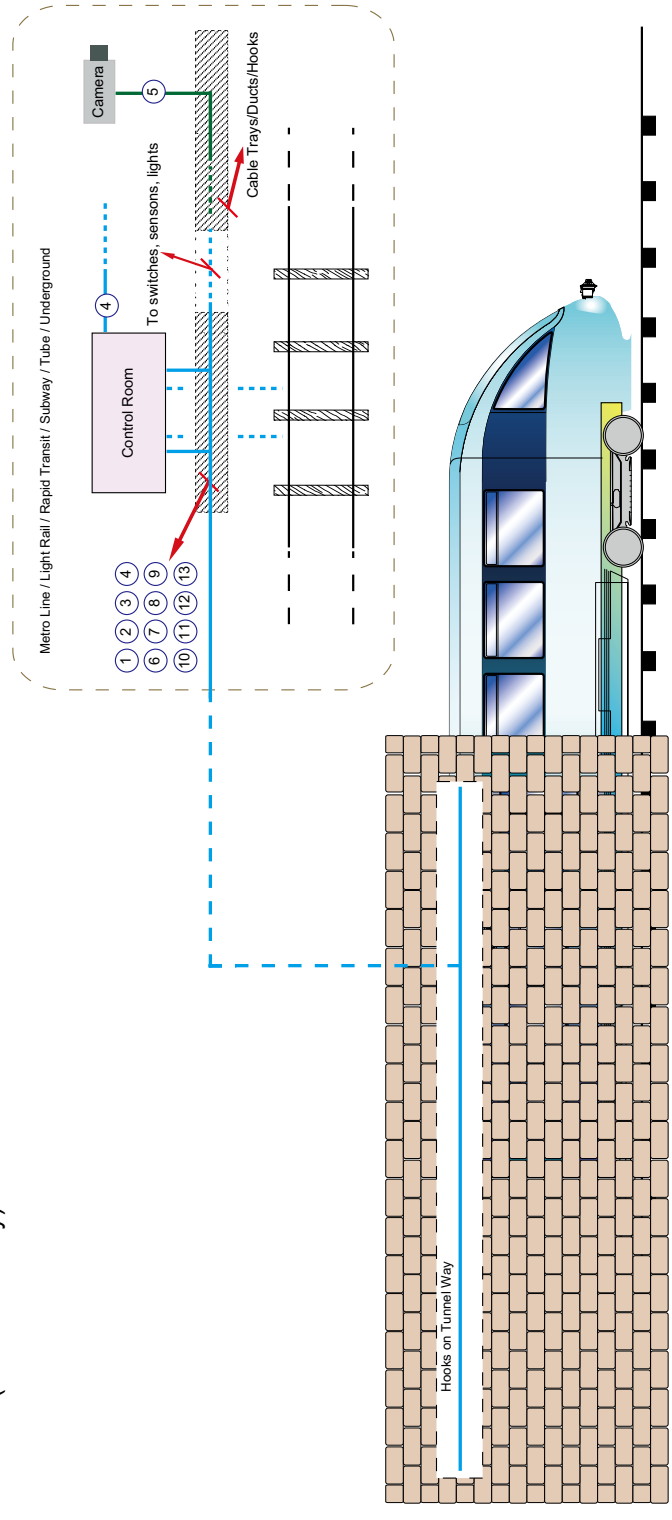


	Cable Types	Cable Code / Standards
①	Board Wiring Cables In Traffic Control Center and Equipment Shelter	CV/CVZ/CV-S/CVZ-S(French Railway Standard)
②	Internal Connection Cables In Server & Control Room	ZUG/ZUT/SUG (French Railway Standard)
③	Multicore, Multipair or Multiquad Trackside Signalling Cables	ZPFU / ZPAU / ZCO3 (French Railway Standard) AJ-2Y2YDB2Y / A-2Y2YB2Y / A-2Y2YV / AJ-2Y(L)2YDB2Y A-2Y2Y(L)B2Y / A-2Y(L)2YV (German Railway Standard) EAPSP / CCPSSP / CCTSST (Spanish Railway Standard) SXCAV / SXCAG (Belgium Railway Standard)
④	Trackside Medium Distance Telcom Cables	MD4 / RT/ZHLS (UK Railway Standard)
⑤	Trackside Fibre Optic Cables	ST2513BR/CT2243 / CT2242 (French Railway Standard) NR/PS/TEL/00014(UK Railway Standard)
⑥	Local Control and Power Supply Cables	SCG (French Railway Standard) BR880 / SE902 / SE1047 (UK Railway Standard)
⑦	Local Signal Cables	ZPGU (French Railway Standard)
⑧	Switching Centre Cables	SW CLT (Swiss Railway Standard)
⑨	Balise Cables	SPFB (French KVB System) EUROBALISE SIF / EUROBALISE BGA (ERTMS System)

	Cable Types	Cable Code / Standards
⑩	Signal Cables	ZPFU (French Railway Standard)
⑪	Point Heating Cables	NR/SP/ELP/40045 Cables (UK Railway Standard)
⑫	Axle Counter Cables	RT/F3 (UK Railway Standard)
⑬	Track Feeder Cables	K25 NFF55625 (French Railway Standard) RT/E/S21101 / EME-SP-14-025/SE908(UK Railway Standard)
⑭	Radiating Cables	K26 (French Railway Standard)
⑮	DC Traction Cables	
⑯	FTN Screening Conductor Cables	NR/PSTEL/31102 (BR1817) (UK Railway Standard)
⑰	Scada/Pilot Cables	
⑱	Conduit Wires	EME-SP-14-026 / SE260L / SE774 / SE895 (UK Railway Standard)
⑲	MV Power Cables	BR7835 / BS6622 / NR/PS/00008 / XKDT (UK Railway Standard)
⑳	Loop Cables	

Trackside Railway Cables (Urban Railway)

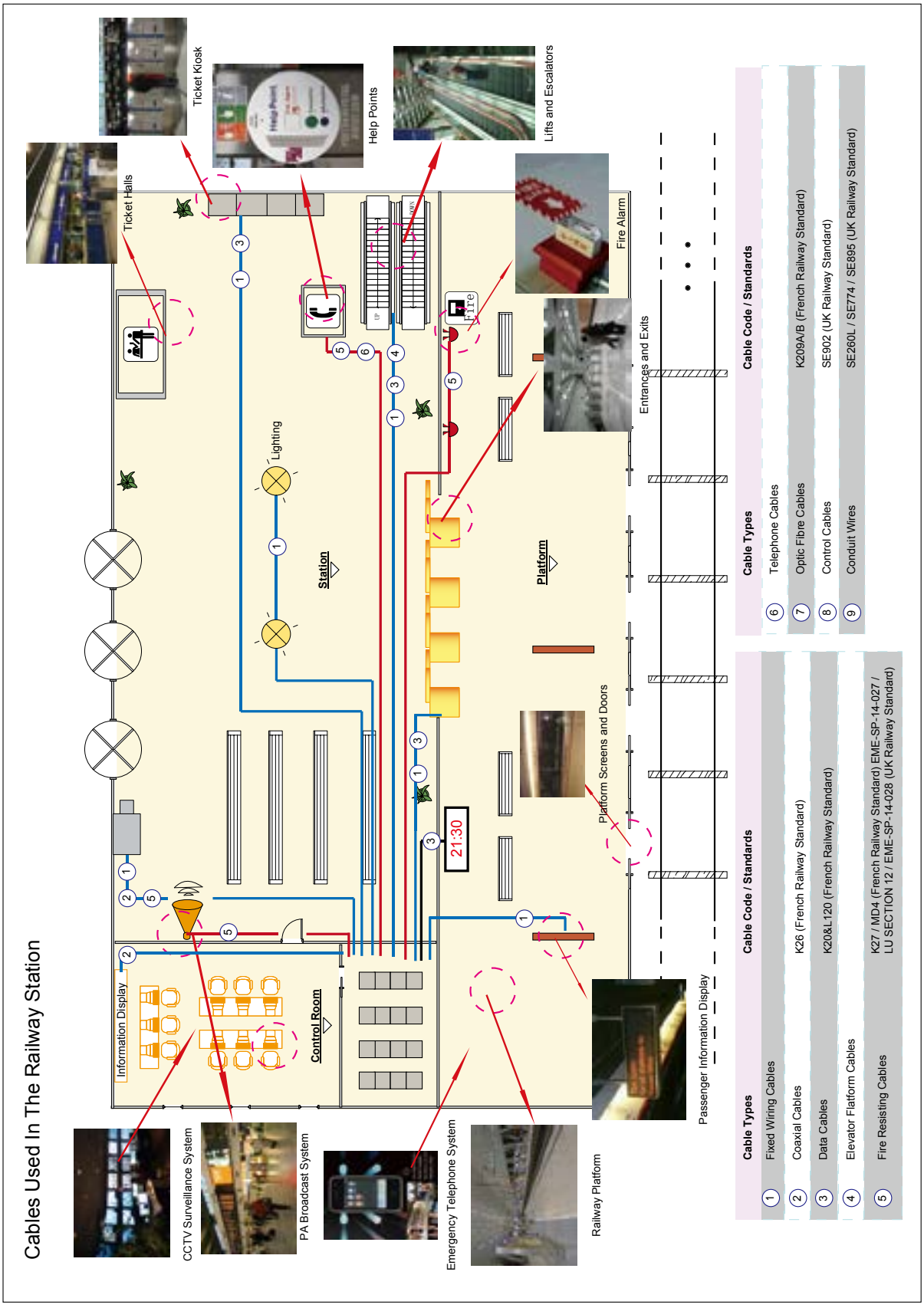
Cables Used Along The Trackside (Urban Railway)



	Cable Types	Cable Code / Standards
1	Signalling & Control Cables	K23 / K24 / K13 (French Railway Standard) RT/ZHLS / TYPE A1 / A2 / A3 / B1 / B2 / C1 / C2 / C3 / D1 / D2 / E1 / E2 / E3 (UK Railway Standard)
2	Copper Telecom Cables	G7621 / G7622 / G7623 (UK Railway Standard) DIGICODE (French Railway Standard)
3	Fiber Optic Cables	K209A/B (French Railway Standard)
4	Databus Cables	L120 & K20 (French Railway Standard)
5	Coaxial Cables	K26 (French Railway Standard)
6	Track Feeder Cables	K25 NFF55625 (French Railway Standard) RT/E/S21101 / EME-SP-14-025/SE908 (UK Railway Standard)
7	Scada/Pilot Cables	

	Cable Types	Cable Code / Standards
8	Conduit Wires	EME-SP-14-026 / SE260L / SE774 / SE895 (UK Railway Standard)
9	Local Control or Power Cables	SE902 / SE1047 / BR880 (UK Railway Standard)
10	DC Traction Cables	1800DC Positive/ 300DC Negative Cables
11	MV Power Cables	BR7835 / BS6622 / NR/PS/00008 (UK Railway Standard)
12	Digicode Cables	
13	Twin Datalink Cables	
14	Loop Cables	

Station Range Railway Cables



RAILWAY SIGNALLING & CONTROL CABLES

Equipment Cables for Control Centre

- France RATP Railway Standard

Multicore Signalling & Control Main Cables for Trackside

- German Railway Standard
- UK Network Rail Standard
- Spain Railway Standard

Multipair/Multiquad Signalling & Control Cables for Trackside

- German Railway Standard
- France RATP Railway Standard
  - Urban Intercity Main Lines
  - Urban Subway
- Spain Railway Standard
- Belgium Railway Standard
- Swiss Railway Standard
- UK Network Rail Standard

Axle Counter Cables

- UK Network Rail Standard

Balise Cables

- French KVB System
- European ERTMS System

Fire Integrity Cables

- France RATP Railway Standard

CV /CVZ Indoor Equipment Cables

Applications

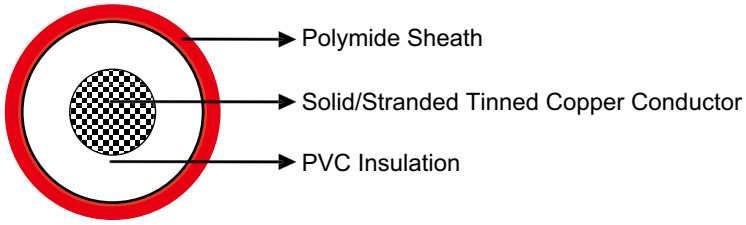
The cables are used as cabling wires for the relays and electronic equipments in the Traffic Control Center and Trackside Equipment Shelter. The CV cables are suitable for use only in Optical Control Panel (OCP) wiring.

Standards

- SNCF CT 500

Construction

- Conductors: Class 5 stranded tinned copper (for flexible wires CV-S & CVZ-S type), class 1 solid tinned copper (for stiff wires CV & CVZ),0.5/1.0/2.5/6.0 mm^2 cross section.
- Insulation: White (for CVZ type)/coloured (for CV type) unleaded PVC.
- Sheath: Coloured polyamide outer sheath (for CVZ & CVZ-S type).



Electrical Characteristics at 20□

CV/CVZ

Nominal Conductor Diameter	mm	0.8	1.17	1.78
Nominal Cross Section Area	mm^2	0.5	1.0	2.5
Maximum Conductor Resistance (DC)	Ω/km	36.1	17.9	7.56
Operating Voltage	V	750		

CV-S/CVZ-S

No of Strands/ Strand Diameter	No/mm	16/0.2	32/0.2	50/0.25	84/0.3
Nominal Cross Section Area	mm^2	0.5	1.0	2.5	6
Maximum Conductor Resistance (DC)	Ω/km	40.1	20.0	8.21	3.39
Operating Voltage	V	750			

Mechanical and Thermal Properties

- Minimum Bending Radius (static): 4xOD (for flexible wire); 5xOD (for stiff wire)
- Minimum Bending Radius (dynamic): 8xOD (for flexible wire); 10xOD (for stiff wire)
- Operating Temperature: -15℃ to +70℃

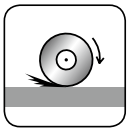
↘ Dimensions and Weight

CV/CVZ Cables

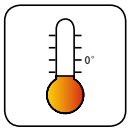
Cable Code	Number of Conductors	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
0.8mm conductor, 1.6mm Insulated wire				
RS/CV-075-Y-1C0.5S	1	-	-	6
1.17mm conductor, 1.9mm Insulated wire				
RS/CVZ-075-Y(4Y)-1C1S	1	0.2	2.3	13.2
1.78mm conductor, 2.7mm Insulated wire				
RS/CVZ-075-Y(4Y)- 1C2.5S	1	0.2	3.1	29.3

CV-S/CVZ-S Cables

Cable Code	Number of Conductors	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
16/0.2mm conductor, 1.6mm Insulated wire				
RS/CV-S-075-Y-1C0.5S	1	-	-	6.8
RS/CVZ-S-075-Y-1C0.5S	1	0.35	2.3	7.6
32/0.2mm conductor, 2.1mm Insulated wire				
RS/CVZ-S-075-Y(4Y)-1C1S	1	0.2	2.5	13.5
RS/CVZ-S-075-Y(4Y)-1P1S	1P	0.2	2.5	28.2
50/0.25mm conductor, 3.0mm Insulated wire				
RS/CVZ-S-075-Y(4Y)- 1C2.5S	1	0.2	3.4	29.3
84/0.3mm conductor, 4.2mm Insulated wire				
RS/CVZ-S-075- Y(4Y)-1C6S	1	0.2	4.6	60.1


Abrasion Retardant

Resistant to High Temperature



Weather Resistant


Mineral Oil Resistant

Rated voltage


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

ZUG/ ZUT/ SUG Indoor Equipment Cables

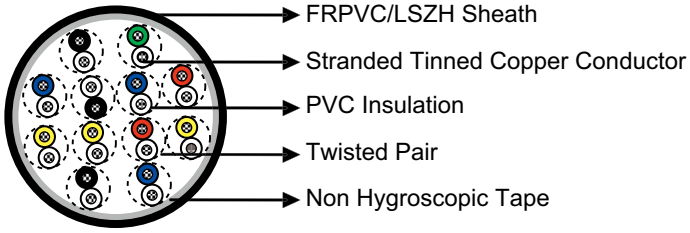
Applications

The cables are used as cabling for the relays and electronic equipments in the Traffic Control Center and Trackside Equipment Shelter. The cables are suitable for indoor interconnection of railway network equipments.

Standards

- SNCF CT 455

Construction



- Conductors: Class 5 stranded tinned copper, 1 mm^2 or 0.38 mm^2 cross section.
- Insulation: Coloured PVC.
- Cabling Element: Pairs (for ZUG/ZUT)/Cores (for SUG).
- Core wrapping (optional): Plastic tape(s) with overlapping.
- Screen (optional): Tinned copper braid for electrostatic protection (only for ZUT type)
- Sheath: Black FRPVC compound. LSZH option can be offered upon request.

Electrical Characteristics at 20□

No of Strands/ Strand Diameter	No/mm	12/0.2	32/0.2
Nominal Cross Section Area	mm^2	0.38	1
Maximum Conductor Resistance (DC)	Ω/km	52.5	20.1
Operating Voltage AC/DC	V	450/750	450/750

Mechanical and Thermal Properties

- Minimum Bending Radius: 4xOD (static); 8xOD (dynamic)
- Operating Temperature: -15℃ to +70℃

Dimensions and Weight

ZUG Cables

Cable Code	Number of Pairs	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
12/0.2mm conductor, 1.4mm Insulated wire				
RS/ZUG-075-YY-28P0.38S	28	0.7	15.7	310
32/0.2mm conductor, 2.09mm Insulated wire				
RS/ZUG-075-YY-1P1S	1	0.7	7.0	59

Cable Code	Number of Pairs	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RS/ZUG-075-YY-3P1S	3	0.7	9.9	108
RS/ZUG-075-YY-6P1S	6	0.7	12.4	184
RS/ZUG-075-YY-12P1S	12	0.7	15.7	335

SUG Cables

Cable Code	Number of Conductors	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
32/0.2mm conductor,2.09mm Insulated wire				
RS/SUG-075-YY-3C1S	3	0.7	8	73

ZUT Cables

Cable Code	Number of Pairs	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
32/0.2mm conductor,2.09mm Insulated wire				
RS/ZUT-075-YY-2P1S	2	0.7	9.5	122
RS/ZUT-075-YY-6P1S	6	0.7	13.5	276
RS/ZUT-075-YY-12P1S	12	0.7	17.5	445

Rated voltage


Laid In Cable Tray


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

SCG Local Control Cables

Applications

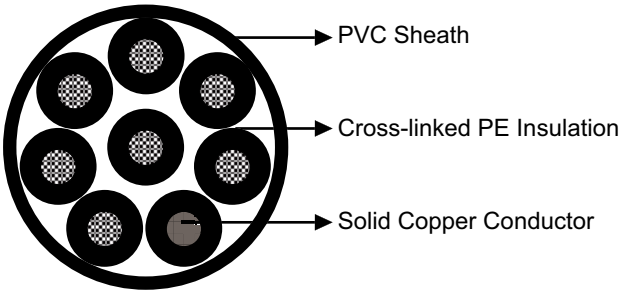
The cables are designed as local control or power supply cables for trackside and between the rails equipments inside the equipment shelter.

Standards

- SNCF CT 466

Construction

- Conductors: Class 1 tinned solid copper.
- Insulation : Cross-linked black polyethylene (XLPE) insulation.
- Sheath: PVC sheath, coloured black.



Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	1.78	2.76
Nominal Cross Section Area	mm^2	2.5	6
Maximum Conductor Resistance (DC)	Ω/km	7.56	3.11
Operating Voltage	V	750	

Mechanical and Thermal Properties

- Minimum Bending Radius: 5xOD (static); 10xOD (dynamic)
- Operating Temperature: -20℃ to +90℃

Rated voltage


Laid In Cable Tray


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Dimensions and Weight

Cable Code	Number of Cores	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
1.78mm conductor, 4mm Insulated wire				
RS/SCG-075-2XY-2C2.5S	2	3.0	14	227
RS/SCG-075-2XY-4C2.5S	4	3.2	17	336
RS/SCG-075-2XY-6C2.5S	6	3.7	19.5	475
RS/SCG-075-2XY-8C2.5S	8	3.9	21	542
2.76mm conductor, 5.4mm Insulated wire				
RS/SCG-075-2XY-2C6S	2	3.6	18	384
RS/SCG-075-2XY-4C6S	4	3.7	20.5	550
RS/SCG-075-2XY-6C6S	6	3.9	23.5	780
RS/SCG-075-2XY-8C6S	8	4.1	26	940

AJ-2Y2YDB2Y S(H115)/S(H145)/S(H95)

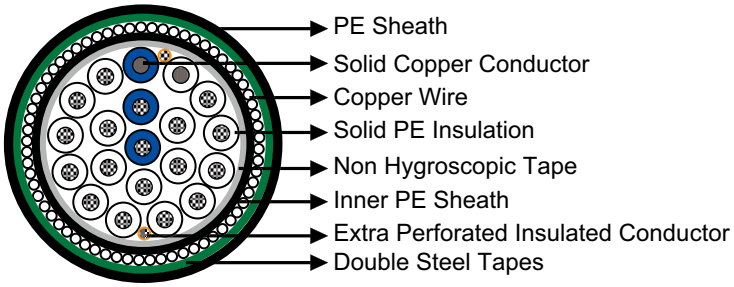
Applications

The cables are designed for transmission of service tensions up to 600 VDC / 420 V_{eff} AC100Hz in railway signalling networks, and are suitable for installation in ducts or laying directly into the ground.

Standards

- Dlk 1.013.107y
- Dlk 1.013.108y (for 1.4/1.8mm conductor H95 type)
- Dlk 1.013.110y

Construction



- Conductors: Solid annealed copper, 0.9, 1.4 or 1.8 mm nominal diameter.
- Insulation: Solid polyethylene.
- Stranding: Single conductors are helically stranded in concentric layers. Cables from 14 conductors on have two extra conductors of 0.5mm with perforated insulation (surveillance conductors).
- Core Wrapping: Plastic tape(s) with overlapping.
- Inner Sheath: Low density polyethylene.
- Electrostatic Shield: One layer of helically applied copper wires (0.9, 1.2, 1.4 or 1.8mm).
- Electromagnetic Shield: Two helically applied steel tapes (0.5 or 0.8mm thick, depending on required reduction factor)
- Outer Sheath: Low density polyethylene.

Type Codes

AJ-	outdoor cable
2Y	solid PE conductor insulation
2Y	inner PE sheath
D	copper wire concentric screen
B	steel tape armor
2Y	outer PE sheath
S	signal cable
LG	layer stranding
H (n)	operating capacity

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.9	1.4	1.8
Maximum Conductor Resistance	Ω/km	28.9	11.9	7.2
Minimum Insulation Resistance @500 V DC (1min)	MΩ.km	10000	10000	10000
Maximum Mutual Capacitance @800Hz (AC)	nF/km	115	145/95*	145/95*
Dielectric Strength, conductor to conductor (DC voltage 1min)	V	3535	3535	3535
Surveillance Conductors				
Loop resistance, maximum	Ω/km	190	190	190
Insulation resistance				
- dry cable core, minimum	MΩ.km	1000	1000	1000
- wet cable core, maximum	KΩ.km	30	30	30
Nominal Reduction Factor @ 100 V/km, 16 2/3 Hz				
rk 401 series		0.15	0.15	0.15
rk 501 series		0.35	0.35	0.35
rk 601 series		0.55	0.55	0.55
Operating Voltage AC/DC	V	420/600	420/600	420/600
Test Voltage 50 Hz 1 min				
Core to Core	V_{eff}	2500	2500	2500
Core to Screen	V_{eff}	2500	2500	2500

*The value “95” is only for cables with 1.4/1.8mm conductors according to Dlk 1.013.108y.

Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

AJ-2Y2YDB2Y n x1x 0.9 S(H115)

Cable Code	Number of conductors (n)	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.9mm conductor, 1.55mm Insulated wire rk 601 Series					
RS107y-2Y2YDB2Y-10C0.9-S(H115)-R6	10	1.3	1.2	19.0	520
RS107y-2Y2YDB2Y-20C0.9-S(H115)-R6	20	1.3	1.2	20.0	650
RS107y-2Y2YDB2Y-30C0.9-S(H115)-R6	30	1.3	1.2	22.0	780
RS107y-2Y2YDB2Y-50C0.9-S(H115)-R6	50	1.3	1.2	25.0	1010
RS107y-2Y2YDB2Y-80C0.9-S(H115)-R6	80	1.3	1.2	29.0	1330
RS107y-2Y2YDB2Y-120C0.9-S(H115)-R6	120	1.3	1.3	32.0	1740
RS107y-2Y2YDB2Y-160C0.9-S(H115)-R6	160	1.3	1.3	35.0	2310
RS107y-2Y2YDB2Y-200C0.9-S(H115)-R6	200	1.3	1.3	38.0	2520
0.9mm conductor, 1.55mm Insulated wire rk 501 Series					
RS107y-2Y2YDB2Y-10C0.9-S(H115)-R5	10	1.3	1.2	19.0	600
RS107y-2Y2YDB2Y-20C0.9-S(H115)-R5	20	1.3	1.2	20.0	740
RS107y-2Y2YDB2Y-30C0.9-S(H115)-R5	30	1.3	1.2	22.0	890
RS107y-2Y2YDB2Y-50C0.9-S(H115)-R5	50	1.3	1.3	25.0	1150
RS107y-2Y2YDB2Y-80C0.9-S(H115)-R5	80	1.3	1.3	29.0	1480
RS107y-2Y2YDB2Y-120C0.9-S(H115)-R5	120	1.5	1.3	32.0	1910
RS107y-2Y2YDB2Y-160C0.9-S(H115)-R5	160	1.5	1.3	35.0	2530
RS107y-2Y2YDB2Y-200C0.9-S(H115)-R5	200	1.5	1.5	38.0	2730

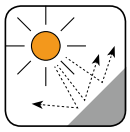
AJ-2Y2YDB2Y n x1x 1.4/1.8 S(H145)

Cable Code	Number of conductors (n)	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
1.4mm conductor, 2.2mm Insulated wire rk 601 Series					
RS107y-2Y2YDB2Y-10C1.4-S(H145)-R6	10	1.3	1.2	21	670
RS107y-2Y2YDB2Y-20C1.4-S(H145)-R6	20	1.3	1.2	23.5	940
RS107y-2Y2YDB2Y-30C1.4-S(H145)-R6	30	1.3	1.2	27	1180
RS107y-2Y2YDB2Y-50C1.4-S(H145)-R6	50	1.3	1.2	31	1650
RS107y-2Y2YDB2Y-80C1.4-S(H145)-R6	80	1.3	1.2	35	2270
RS107y-2Y2YDB2Y-120C1.4-S(H145)-R6	120	1.3	1.3	41	3110
RS107y-2Y2YDB2Y-160C1.4-S(H145)-R6	160	1.3	1.3	46	3900
RS107y-2Y2YDB2Y-200C1.4-S(H145)-R6	200	1.3	1.3	49	4670
1.4mm conductor, 2.2mm Insulated wire rk 501 Series					
RS107y-2Y2YDB2Y-10C1.4-S(H145)-R5	10	1.3	1.2	21	780
RS107y-2Y2YDB2Y-20C1.4-S(H145)-R5	20	1.3	1.2	23.5	1070
RS107y-2Y2YDB2Y-30C1.4-S(H145)-R5	30	1.3	1.2	26	1320
RS107y-2Y2YDB2Y-50C1.4-S(H145)-R5	50	1.3	1.3	31	1810
RS107y-2Y2YDB2Y-80C1.4-S(H145)-R5	80	1.3	1.3	35	2460
RS107y-2Y2YDB2Y-120C1.4-S(H145)-R5	120	1.5	1.3	42	3380
RS107y-2Y2YDB2Y-160C1.4-S(H145)-R5	160	1.5	1.3	46	4190
RS107y-2Y2YDB2Y-200C1.4-S(H145)-R5	200	1.5	1.5	49	5000
1.4mm conductor, 2.2mm Insulated wire rk 401 Series					
RS107y-2Y2YDB2Y-10C1.4-S(H145)-R4	10	1.3	1.2	23	960
RS107y-2Y2YDB2Y-20C1.4-S(H145)-R4	20	1.3	1.2	25.6	1260
RS107y-2Y2YDB2Y-30C1.4-S(H145)-R4	30	1.3	1.3	28	1940
RS107y-2Y2YDB2Y-50C1.4-S(H145)-R4	50	1.3	1.3	33	2450
RS107y-2Y2YDB2Y-80C1.4-S(H145)-R4	80	1.5	1.3	38	3280
RS107y-2Y2YDB2Y-120C1.4-S(H145)-R4	120	1.5	1.5	44	4290
RS107y-2Y2YDB2Y-160C1.4-S(H145)-R4	160	1.5	1.5	48	5200
RS107y-2Y2YDB2Y-200C1.4-S(H145)-R4	200	1.5	1.5	52	6060
1.8mm conductor, 2.7mm Insulated wire rk 601 Series					
RS107y-2Y2YDB2Y-10C1.8-S(H145)-R6	10	1.3	1.2	23	850
RS107y-2Y2YDB2Y-20C1.8-S(H145)-R6	20	1.3	1.2	27	1260
RS107y-2Y2YDB2Y-30C1.8-S(H145)-R6	30	1.3	1.3	30	1620
RS107y-2Y2YDB2Y-50C1.8-S(H145)-R6	50	1.3	1.3	36	2080
RS107y-2Y2YDB2Y-80C1.8-S(H145)-R6	80	1.5	1.3	41	3310
RS107y-2Y2YDB2Y-120C1.8-S(H145)-R6	120	1.5	1.5	48	4570
RS107y-2Y2YDB2Y-160C1.8-S(H145)-R6	160	1.5	1.5	54	5950
RS107y-2Y2YDB2Y-200C1.8-S(H145)-R6	200	1.5	1.5	58	6970
1.8mm conductor, 2.7mm Insulated wire rk 501 Series					
RS107y-2Y2YDB2Y-10C1.8-S(H145)-R5	10	1.3	1.2	23	970
RS107y-2Y2YDB2Y-20C1.8-S(H145)-R5	20	1.3	1.2	27	1410
RS107y-2Y2YDB2Y-30C1.8-S(H145)-R5	30	1.3	1.3	30	1780
RS107y-2Y2YDB2Y-50C1.8-S(H145)-R5	50	1.3	1.3	36	2520
RS107y-2Y2YDB2Y-80C1.8-S(H145)-R5	80	1.5	1.3	42	3570
RS107y-2Y2YDB2Y-120C1.8-S(H145)-R5	120	1.5	1.5	49	5950
RS107y-2Y2YDB2Y-160C1.8-S(H145)-R5	160	1.5	1.5	55	6170
RS107y-2Y2YDB2Y-200C1.8-S(H145)-R5	200	1.5	1.5	59	7380
1.8mm conductor, 2.7mm Insulated wire rk 401 Series					
RS107y-2Y2YDB2Y-10C1.8-S(H145)-R4	10	1.3	1.2	25	1160
RS107y-2Y2YDB2Y-20C1.8-S(H145)-R4	20	1.3	1.2	29	1700
RS107y-2Y2YDB2Y-30C1.8-S(H145)-R4	30	1.3	1.3	32	2400
RS107y-2Y2YDB2Y-50C1.8-S(H145)-R4	50	1.3	1.3	38	3350
RS107y-2Y2YDB2Y-80C1.8-S(H145)-R4	80	1.5	1.3	44	3310
RS107y-2Y2YDB2Y-120C1.8-S(H145)-R4	120	1.5	1.5	51	4900
RS107y-2Y2YDB2Y-160C1.8-S(H145)-R4	160	1.5	1.5	57	7340
RS107y-2Y2YDB2Y-200C1.8-S(H145)-R4	200	1.5	1.5	61	8650

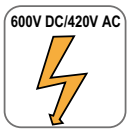
AJ-2Y2YDB2Y n x1x 1.4/1.8 S(H95)

Cable Code	Number of conductors (n)	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
1.4mm conductor, 2.7mm Insulated wire rk 501 Series					
RS108y-2Y2YDB2Y-10C1.4-S(H95)-R5	10	1.3	1.2	22.0	900
RS108y-2Y2YDB2Y-14C1.4-S(H95)-R5	14	1.3	1.2	24.0	1010
RS108y-2Y2YDB2Y-20C1.4-S(H95)-R5	20	1.3	1.2	27.0	1220
RS108y-2Y2YDB2Y-30C1.4-S(H95)-R5	30	1.3	1.2	30.0	1520
RS108y-2Y2YDB2Y-50C1.4-S(H95)-R5	50	1.3	1.3	35.0	2090
1.4mm conductor, 2.7mm Insulated wire rk 401 Series					
RS108y-2Y2YDB2Y-30C1.4-S(H95)-R4	30	1.3	1.2	32.0	2150
RS108y-2Y2YDB2Y-50C1.4-S(H95)-R4	50	1.3	1.3	38.0	2900
1.8mm conductor,3.4mm Insulated wire rk 501 Series					
RS108y-2Y2YDB2Y-10C1.8-S(H95)-R5	10	1.3	1.2	25.0	1130
RS108y-2Y2YDB2Y-14C1.8-S(H95)-R5	14	1.3	1.2	27.0	1330
RS108y-2Y2YDB2Y-20C1.8-S(H95)-R5	20	1.3	1.2	30.0	1620
RS108y-2Y2YDB2Y-30C1.8-S(H95)-R5	30	1.3	1.3	34.0	2340
RS108y-2Y2YDB2Y-50C1.8-S(H95)-R5	50	1.3	1.3	42.0	3020
1.8mm conductor,3.4mm Insulated wire rk 401 Series					
RS108y-2Y2YDB2Y-30C1.8-S(H95)-R4	30	1.3	1.3	37.0	2880
RS108y-2Y2YDB2Y-50C1.8-S(H95)-R4	50	1.3	1.3	44.0	3950

Anti Induction


UV Resistant


Water Resistant



Rated Voltage


Laid In Ducts


Buried in Ground

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

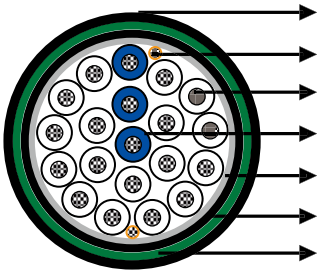
A-2Y2YB2Y S(H115)/S(H145)/S(H95)

Applications

The cables are designed in railways signalling networks, and are suitable for installation in ducts or laying directly into the ground.

Standards

- Dlk 1.013.107y
- Dlk 1.013.108y (for 1.4/1.8mm conductor H95 type)
- Dlk 1.013.110y



Construction

- Conductors: Solid annealed copper, 0.9, 1.4 or 1.8 mm nominal diameter.
- Insulation: Solid polyethylene.
- Stranding: Single conductors are helically stranded in concentric layers. Cables from 14 conductors on have two extra conductors of 0.5mm with perforated insulation (surveillance conductors).
- Core Wrapping: Plastic tape(s) with overlapping.
- Inner Sheath: Low density polyethylene.
- Armouring: One layer of galvanized steel tape (0.2-0.3mm) or two layers of galvanized steel tapes (0.1mm).
- Outer Sheath: Low density polyethylene.

Type Codes

A–	outdoor cable
2Y	solid PE conductor insulation
2Y	inner PE sheath
B	steel tape armor
2Y	PE outer sheath
S	signal cable
LG	layer stranding
H(n)	operating capacity

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.9	1.4	1.8
Maximum Conductor Resistance	Ω/km	28.9	11.9	7.2

Minimum Insulation Resistance @500 V DC (1min)	MΩ.km	10000	10000	10000
Maximum Conductor Capacitance @800Hz (AC)	nF/km	115	145/95*	145/95*
Dielectric Strength, conductor to conductor (DC voltage 1min)	V	3535	3535	3535
Surveillance Conductors				
Loop resistance, maximum	Ω/km	190	190	190
Insulation resistance				
- dry cable core, minimum	MΩ.km	1000	1000	1000
- wet cable core, maximum	KΩ.km	30	30	30
Operating Voltage AC/DC	V	420/600	420/600	420/600
Test Voltage 50 Hz 1 min	V_{eff}			
Core to Core	V_{eff}	2500	2500	2500
Core to Screen	V_{eff}	2500	2500	2500

*The value “95” is only for cables with 1.4/1.8mm conductors according to Dlk 1.013.108y.

Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

A-2Y2YB2Y n x1x 0.9 S(H115)

Cable Code	Number of conductors (n)	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.9mm conductor,1.55mm Insulated wire					
RS107y-2Y2YB2Y-2C0.9-S(H115)	2	1.3	1.2	12.0	120
RS107y-2Y2YB2Y-4C0.9-S(H115)	4	1.3	1.2	13.0	140
RS107y-2Y2YB2Y-7C0.9-S(H115)	7	1.3	1.2	14.0	170
RS107y-2Y2YB2Y-10C0.9-S(H115)	10	1.3	1.2	15.5	220
RS107y-2Y2YB2Y-14C0.9-S(H115)	14	1.3	1.2	16.0	260
RS107y-2Y2YB2Y-20C0.9-S(H115)	20	1.3	1.2	17.0	320
RS107y-2Y2YB2Y-24C0.9-S(H115)	24	1.3	1.2	19.0	370
RS107y-2Y2YB2Y-30C0.9-S(H115)	30	1.3	1.2	19.0	410
RS107y-2Y2YB2Y-40C0.9-S(H115)	40	1.3	1.2	20.0	500
RS107y-2Y2YB2Y-50C0.9-S(H115)	50	1.3	1.2	22.0	590
RS107y-2Y2YB2Y-60C0.9-S(H115)	60	1.3	1.2	23.0	680
RS107y-2Y2YB2Y-80C0.9-S(H115)	80	1.3	1.2	25.0	840
RS107y-2Y2YB2Y-100C0.9-S(H115)	100	1.3	1.3	28.0	1020
RS107y-2Y2YB2Y-120C0.9-S(H115)	120	1.3	1.3	29.0	1180
RS107y-2Y2YB2Y-140C0.9-S(H115)	140	1.3	1.3	31.0	1360

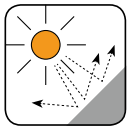
A-2Y2YB2Y n x1x 1.4/1.8 S(H145)

Cable Code	Number of conductors (n)	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
1.4mm conductor,2.2mm Insulated wire					
RS107y-2Y2YB2Y-4C1.4-S(H145)	4	1.3	1.2	14.0	190
RS107y-2Y2YB2Y-7C1.4-S(H145)	7	1.3	1.2	15.5	260
RS107y-2Y2YB2Y-10C1.4-S(H145)	10	1.3	1.2	18.0	340
RS107y-2Y2YB2Y-14C1.4-S(H145)	14	1.3	1.2	19.0	420
RS107y-2Y2YB2Y-20C1.4-S(H145)	20	1.3	1.2	21.0	550
RS107y-2Y2YB2Y-24C1.4-S(H145)	24	1.3	1.2	22.0	630

Cable Code	Number of conductors (n)	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
RS107y-2Y2YB2Y-30C1.4-S(H145)	30	1.3	1.2	23.0	750
RS107y-2Y2YB2Y-40C1.4-S(H145)	40	1.3	1.2	25.0	940
RS107y-2Y2YB2Y-50C1.4-S(H145)	50	1.3	1.3	28.0	1140
RS107y-2Y2YB2Y-60C1.4-S(H145)	60	1.3	1.3	30.0	1320
1.8mm conductor, 2.7mm Insulated wire					
RS107y-2Y2YB2Y-4C1.8-S(H145)	4	1.3	1.2	15.5	250
RS107y-2Y2YB2Y-7C1.8-S(H145)	7	1.3	1.2	17.0	350
RS107y-2Y2YB2Y-10C1.8-S(H145)	10	1.3	1.2	20.0	470
RS107y-2Y2YB2Y-14C1.8-S(H145)	14	1.3	1.2	21.0	600
RS107y-2Y2YB2Y-20C1.8-S(H145)	20	1.3	1.2	24.0	800
RS107y-2Y2YB2Y-24C1.8-S(H145)	24	1.3	1.2	26.0	910
RS107y-2Y2YB2Y-30C1.8-S(H145)	30	1.3	1.2	27.0	1100
RS107y-2Y2YB2Y-40C1.8-S(H145)	40	1.3	1.2	30.0	1400

A-2Y2YB2Y n x1x 1.4 S(H95)

Cable Code	Number of conductors (n)	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
1.4mm conductor, 2.7mm Insulated wire					
RS108y-2Y2YB2Y-10C1.4-S(H95)	10	1.3	1.2	18.0	390
RS108y-2Y2YB2Y-14C1.4-S(H95)	14	1.3	1.2	20.0	480
RS108y-2Y2YB2Y-20C1.4-S(H95)	20	1.3	1.2	22.0	610
1.8mm conductor, 3.4mm Insulated wire					
RS108y-2Y2YB2Y-10C1.8-S(H95)	10	1.3	1.2	21.0	550
RS108y-2Y2YB2Y-14C1.8-S(H95)	14	1.3	1.2	23.0	700

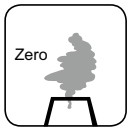

UV Resistant


Water Resistant

Rated Voltage


Laid In Ducts


Buried in Ground



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

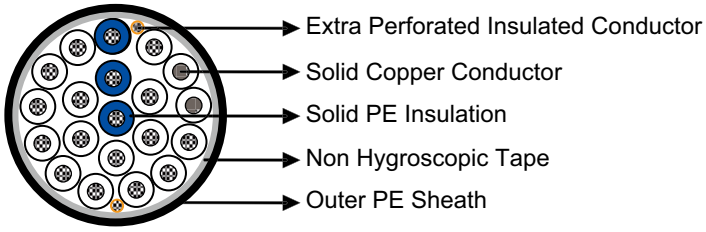
A-2Y2Yv S(H115)/S(H145)/S(H95)

Applications

The cables are designed for general uses in protective devises in railways signalling networks, and are suitable for installation in ducts.

Standards

- Dlk 1.013.107y
- Dlk 1.013.108y (for 1.4/1.8mm conductor H95 type)
- Dlk 1.013.110y



Construction

- Conductors: Solid annealed copper, 0.9, 1.4 or 1.8 mm nominal diameter.
- Insulation: Solid polyethylene.
- Stranding: Single conductors are helically stranded in concentric layers. Cables from 14 conductors on, have two extra conductors with perforated insulation (surveillance conductors).
- Core Wrapping: Plastic tape(s) with overlapping.
- Outer Sheath: Low density polyethylene.

Type Codes

A–	outdoor cable
2Y	solid PE conductor insulation
2Yv	PE sheath with increased wall thickness
S	signal cable
LG	layer stranding
H(n)	operating capacity

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.9	1.4	1.8
Maximum Conductor Resistance	Ω/km	28.9	11.9	7.2
Minimum Insulation Resistance @500 V DC (1min)	MΩ.km	10000	10000	10000
Maximum Conductor Capacitance @800Hz (AC)	nF/km	115	145/95*	145/95*
Dielectric Strength, conductor to conductor (DC voltage 1min)	V	3535	3535	3535
Surveillance Conductors				
Loop resistance, maximum	Ω/km	190	190	190
Insulation resistance				
- dry cable core, minimum	MΩ.km	1000	1000	1000

- wet cable core, maximum	KΩ.km	30	30	30
Operating Voltage AC/DC	V	420/600	420/600	420/600
Test Voltage 50 Hz 1 min	V_{eff}			
Core to Core	V_{eff}	2500	2500	2500
Core to Screen	V_{eff}	2500	2500	2500

*The value "95" is only for cables with 1.4/1.8mm conductors according to Dlk 1.013.108y.

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ to +60℃ (during installation)

Dimensions and Weight

A-2Y2Yv n x1x 0.9 S(H115)

Cable Code	Number of conductors (n)	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
0.9mm conductor,1.55mm Insulated wire				
RS107y-2Y2Yv-2C0.9-S(H115)	2	2.0	9.0	60
RS107y-2Y2Yv-4C0.9-S(H115)	4	2.0	9.0	75
RS107y-2Y2Yv-7C0.9-S(H115)	7	2.0	11.0	100
RS107y-2Y2Yv-10C0.9-S(H115)	10	2.0	12.0	130
RS107y-2Y2Yv-14C0.9-S(H115)	14	2.0	13.0	170
RS107y-2Y2Yv-20C0.9-S(H115)	20	2.0	14.0	220
RS107y-2Y2Yv-24C0.9-S(H115)	24	2.0	15.0	260
RS107y-2Y2Yv-30C0.9-S(H115)	30	2.2	16.0	310
RS107y-2Y2Yv-40C0.9-S(H115)	40	2.2	17.0	380
RS107y-2Y2Yv-50C0.9-S(H115)	50	2.2	19.0	460
RS107y-2Y2Yv-60C0.9-S(H115)	60	2.2	20.0	540
RS107y-2Y2Yv-80C0.9-S(H115)	80	2.2	22.0	690
RS107y-2Y2Yv-100C0.9-S(H115)	100	2.2	25.0	850
RS107y-2Y2Yv-120C0.9-S(H115)	120	2.2	26.0	990
RS107y-2Y2Yv-140C0.9-S(H115)	140	2.2	28.0	1150
RS107y-2Y2Yv-160C0.9-S(H115)	160	2.2	29.0	1260
RS107y-2Y2Yv-180C0.9-S(H115)	180	2.2	32.0	1460
RS107y-2Y2Yv-200C0.9-S(H115)	200	2.2	32.0	1600

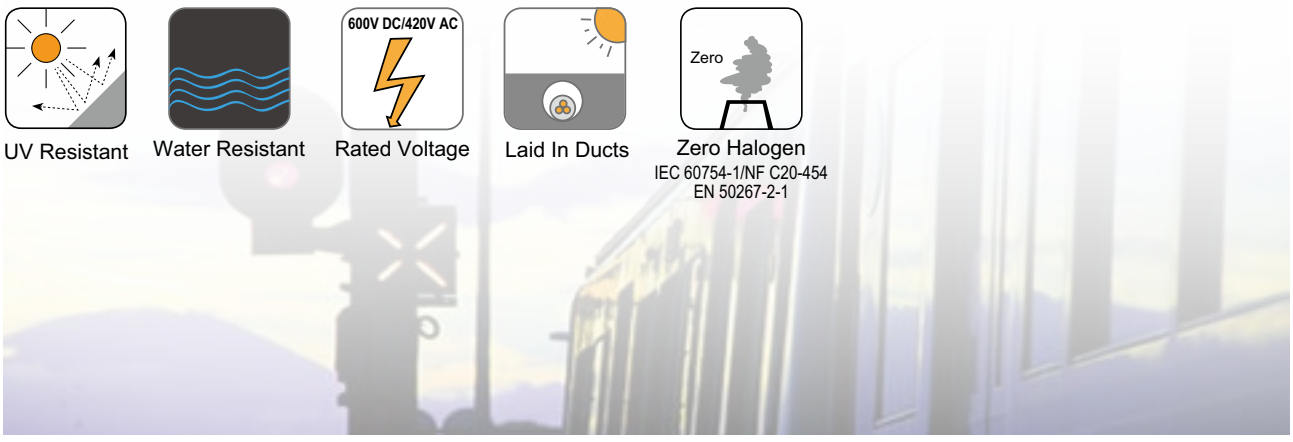
A-2Y2Yv n x1x 1.4/1.8 S(H145)

Cable Code	Number of conductors (n)	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
1.4mm conductor, 2.2mm Insulated wire				
RS107y-2Y2Yv-4C1.4-S(H145)	4	2.0	11.0	120
RS107y-2Y2Yv-7C1.4-S(H145)	7	2.0	12.0	180
RS107y-2Y2Yv-10C1.4-S(H145)	10	2.0	15.0	240
RS107y-2Y2Yv-14C1.4-S(H145)	14	2.2	16.0	320
RS107y-2Y2Yv-20C1.4-S(H145)	20	2.2	17.0	430
RS107y-2Y2Yv-24C1.4-S(H145)	24	2.2	19.0	500
RS107y-2Y2Yv-30C1.4-S(H145)	30	2.2	20.0	600
RS107y-2Y2Yv-40C1.4-S(H145)	40	2.2	22.0	770
RS107y-2Y2Yv-50C1.4-S(H145)	50	2.2	24.0	950
RS107y-2Y2Yv-60C1.4-S(H145)	60	2.2	26.0	1120
RS107y-2Y2Yv-80C1.4-S(H145)	80	2.2	29.0	1450
RS107y-2Y2Yv-100C1.4-S(H145)	100	2.2	33.0	1810

Cable Code	Number of conductors (n)	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RS107y-2Y2Yv-120C1.4-S(H145)	120	2.2	35.0	2140
RS107y-2Y2Yv-140C1.4-S(H145)	140	2.2	37.0	2470
RS107y-2Y2Yv-160C1.4-S(H145)	160	2.2	39.0	2800
RS107y-2Y2Yv-180C1.4-S(H145)	180	2.2	42.0	3140
RS107y-2Y2Yv-200C1.4-S(H145)	200	2.2	43.0	3460
1.8mm conductor, 2.7mm Insulated wire				
RS107y-2Y2Yv-4C1.8-S(H145)	4	2.0	12.0	170
RS107y-2Y2Yv-7C1.8-S(H145)	7	2.0	14.0	260
RS107y-2Y2Yv-10C1.8-S(H145)	10	2.0	17.0	355
RS107y-2Y2Yv-14C1.8-S(H145)	14	2.2	18.0	475
RS107y-2Y2Yv-20C1.8-S(H145)	20	2.2	21.0	655
RS107y-2Y2Yv-24C1.8-S(H145)	24	2.2	22.0	760
RS107y-2Y2Yv-30C1.8-S(H145)	30	2.2	24.0	930
RS107y-2Y2Yv-40C1.8-S(H145)	40	2.2	27.0	1210
RS107y-2Y2Yv-50C1.8-S(H145)	50	2.2	29.0	1480
RS107y-2Y2Yv-60C1.8-S(H145)	60	2.2	31.0	1760
RS107y-2Y2Yv-80C1.8-S(H145)	80	2.2	35.0	2310
RS107y-2Y2Yv-100C1.8-S(H145)	100	2.2	40.0	2860
RS107y-2Y2Yv-120C1.8-S(H145)	120	2.2	42.0	3390
RS107y-2Y2Yv-140C1.8-S(H145)	140	2.2	46.0	3930
RS107y-2Y2Yv-160C1.8-S(H145)	160	2.2	49.0	4500
RS107y-2Y2Yv-180C1.8-S(H145)	180	2.2	52.0	5100
RS107y-2Y2Yv-200C1.8-S(H145)	200	2.2	53.0	5600

A-2Y2Yv n x1x 1.4/1.8 S(H95)

Cable Code	Number of conductors (n)	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
1.4mm conductor, 2.7mm Insulated wire				
RS108y-2Y2Yv-10C1.4-S(H95)	10	2.0	16.0	270
RS108y-2Y2Yv-14C1.4-S(H95)	14	2.0	18.0	350
RS108y-2Y2Yv-20C1.4-S(H95)	20	2.0	20.0	470
RS108y-2Y2Yv-30C1.4-S(H95)	30	2.2	24.0	670
RS108y-2Y2Yv-50C1.4-S(H95)	50	2.2	29.0	1050
1.8mm conductor, 3.4mm Insulated wire				
RS108y-2Y2Yv-10C1.8-S(H95)	10	2.0	19.0	400
RS108y-2Y2Yv-14C1.8-S(H95)	14	2.2	21.0	540
RS108y-2Y2Yv-20C1.8-S(H95)	20	2.2	24.0	730
RS108y-2Y2Yv-30C1.8-S(H95)	30	2.2	28.0	1050
RS108y-2Y2Yv-50C1.8-S(H95)	50	2.2	36.0	1700



UV Resistant

Water Resistant

Rated Voltage

Laid In Ducts

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

TYPE A1, A2 & A3 Railway Signalling Cable

Applications

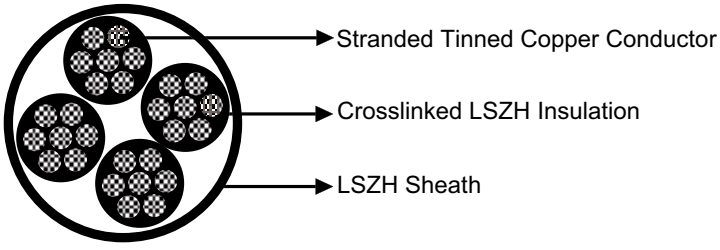
The cables are designed for railway signalling systems. The cables are suitable for use in d.c. circuits where the nominal voltage to earth does not exceed 1100 volts and are suitable for installation in ducts.

Standards

- NR/PS/SIG/00005(formerly RT/E/PS/00005)

Construction

- Conductors: Tinned stranded copper, class 2 according to IEC 60228 & BS6360.
- Insulation: LSZH crosslinked.
- Core Wrapping: Plastic tape(s) with overlapping.
- Sheath: LSZH (for types A2 & A3 only).



Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	0.75	1.15
Maximum Conductor DC Resistance	Ω/km	24.8	17.3
Voltage Rating	KV	0.65/1.1	
Nominal Insulation Thickness	mm	0.85	0.85

Mechanical and Thermal Properties

- Minimum Bending Radius: 6xOD (static); 15xOD (dynamic)
- Temperature Range: -25℃ to +85℃ (during operation); -10℃ to +85℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
Type A1(without sheath)					
RS/A1-H-1C0.75S(BL)	1x0.75(blue)	7/0.37	-	2.7/3.2	16
RS/A1-H-1C0.75S(BR)	1x0.75(brown)	7/0.37	-	2.7/3.2	16
RS/A1-H-1C0.75S(RD)	1x0.75(red)	7/0.37	-	2.7/3.2	16
RS/A1-H-1C0.75S(OR)	1x0.75(orange)	7/0.37	-	2.7/3.2	16

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
RS/A1-H-1C0.75S(GR)	1x0.75(green)	7/0.37	-	2.7/3.2	16
RS/A1-H-1C0.75S(VI)	1x0.75(violet)	7/0.37	-	2.7/3.2	16
RS/A1-H-1C0.75S	1x0.75(black)	7/0.37	-	2.7/3.2	16
RS/A1-H-1C1.15S	1x1.15(black)	16/0.30	-	2.9/3.6	21
Type A2(with sheath)					
RS/A2-3GH-1C0.75S	1x0.75	7/0.37	0.7	4.0/5.0	30
RS/A2-3GH-1C1.15S	1x1.15	16/0.30	0.7	4.3/5.3	35
Type A3(with sheath)					
RS/A3-3GH-2C0.75S	2x0.75	7/0.37	0.9	6.7/8.8	67
RS/A3-3GH-4C0.75S	4x0.75	7/0.37	1.0	8.0/10.4	108
RS/A3-3GH-6C0.75S	6x0.75	7/0.37	1.1	9.7/12.5	160
RS/A3-3GH-10C0.75S	10x0.75	7/0.37	1.2	12.6/16.1	259
RS/A3-3GH-14C0.75S	14x0.75	7/0.37	1.3	13.8/17.7	495
RS/A3-3GH-36C0.75S	36x0.75	7/0.37	1.6	21.6/26.9	752
RS/A3-3GH-48C0.75S	48x0.75	7/0.37	1.6	24.3/30.7	963


Impact Resistant


Highly Flexible


Oil Resistant

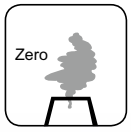

Weather Resistant

Rated Voltage


Laid In Ducts


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

TYPE B1 & B2 Railway Signalling Cable

Applications

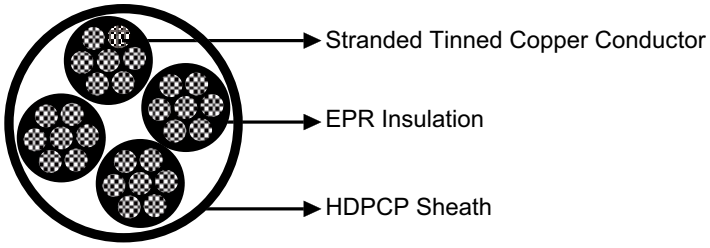
The cables are designed for railway signalling systems. The cables are suitable for use in d.c. circuits where the nominal voltage to earth does not exceed 1100 volts and installation in ducts.

Standards

- NR/PS/SIG/00005(formerly RT/E/PS/00005)

Construction

- Conductors: Tinned stranded copper, class 2 according to IEC 60228 & BS6360.
- Insulation: EPR Type GP4 to BS7655.
- Core Wrapping: Plastic tape(s) with overlapping.
- Sheath: HDPCP Type RS2 to BS7655.



Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	0.75	1.5	2.5	10.0	16.0	35.0	70.0	95.0
Maximum DC Conductor Resistance	Ω/km	24.8	12.2	7.56	1.84	1.16	0.529	0.27	0.195
Voltage Rating	KV	0.65/1.1							
Nominal Insulation Thickness	mm	0.85	0.8	0.8	1.0	1.0	1.2	1.4	1.6

Mechanical and Thermal Properties

- Minimum Bending Radius: 6xOD (static); 15xOD (dynamic)
- Temperature Range: -25℃ to +85℃ (during operation); -10℃ to +85℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
Type B1					
RS/B1-3G5G-1C0.75S	1 x 0.75	7/0.37	2.0	6.5/8.1	28
RS/B1-3G5G-1C1.5S	1 x 1.5	7/0.53	2.0	6.8/8.5	31
RS/B1-3G5G-1C2.5S	1 x 2.5	7/0.67	2.0	7.2/8.9	34

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
RS/B1-3G5G-1C10S	1 x 10.0	7/1.35	2.0	9.4/11.8	205
RS/B1-3G5G-1C35S	1 x 35.0	19/1.53	2.0	12.9/16.1	495
		Type B2			
RS/B2-3G5G-2C1.5S	2 x 1.5	7/0.53	2.0	9.4/12.1	135
RS/B2-3G5G-2C2.5S	2 x 2.5	7/0.67	2.0	10.5/13.1	170
RS/B2-3G5G-2C10S	2 x 10.0	7/1.35	2.0	15.0/18.7	443
RS/B2-3G5G-2C16S	2 x 16.0	7/1.70	2.0	16.7/20.9	625
RS/B2-3G5G-2C35S	2 x 35.0	19/1.53	2.2	22.3/27.8	1232
RS/B2-3G5G-2C70S	2 x 70.0	19/2.14	2.4	28.8/36.0	2053
RS/B2-3G5G-2C95S	2 x 95.0	19/2.52	2.6	33.2/41.5	2968
RS/B2-3G5G-4C0.75S	4 x 0.75	7/0.37	2.0	10.2/12.8	140
RS/B2-3G5G-7C0.75S	7 x 0.75	7/0.37	2.0	11.8/14.7	214
RS/B2-3G5G-10C0.75S	10 x 0.75	7/0.37	2.0	14.4/18.0	280
RS/B2-3G5G-12C0.75S	12 x 0.75	7/0.37	2.0	14.8/18.5	321
RS/B2-3G5G-19C0.75S	19 x 0.75	7/0.37	2.0	17.0/21.3	451
RS/B2-3G5G-27C0.75S	27 x 0.75	7/0.37	2.0	20.1/25.1	602
RS/B2-3G5G-37C0.75S	37 x 0.75	7/0.37	2.2	22.7/28.4	799
RS/B2-3G5G-48C0.75S	48 x 0.75	7/0.37	2.2	25.7/32.2	973
RS/B2-3G5G-4C1.5S	4 x 1.5	7/0.53	2.0	10.9/13.7	217
RS/B2-3G5G-7C1.5S	7 x 1.5	7/0.53	2.0	12.6/15.8	296
RS/B2-3G5G-10C1.5S	10 x 1.5	7/0.53	2.0	15.6/19.4	401
RS/B2-3G5G-12C1.5S	12 x 1.5	7/0.53	2.0	16.0/20.0	437
RS/B2-3G5G-19C1.5S	19 x 1.5	7/0.53	2.0	18.5/23.1	615
RS/B2-3G5G-27C1.5S	27 x 1.5	7/0.53	2.2	22.2/27.8	856
RS/B2-3G5G-37C1.5S	37 x 1.5	7/0.53	2.2	25.1/31.4	1126
RS/B2-3G5G-48C1.5S	48 x 1.5	7/0.53	2.4	28.1/35.1	1494
RS/B2-3G5G-4C2.5S	4 x 2.5	7/0.67	2.0	11.9/14.8	260
RS/B2-3G5G-7C2.5S	7 x 2.5	7/0.67	2.0	13.8/17.2	370
RS/B2-3G5G-10C2.5S	10 x 2.5	7/0.67	2.0	17.1/21.3	520
RS/B2-3G5G-12C2.5S	12 x 2.5	7/0.67	2.0	17.6/22.0	599
RS/B2-3G5G-19C2.5S	19 x 2.5	7/0.67	2.0	20.4/25.5	835
RS/B2-3G5G-27C2.5S	27 x 2.5	7/0.67	2.2	24.6/30.7	1232
RS/B2-3G5G-37C2.5S	37 x 2.5	7/0.67	2.4	27.8/34.7	1623
RS/B2-3G5G-48C2.5S	48 x 2.5	7/0.67	2.6	31.2/39.0	2032
RS/B2-3G5G-6P0.75S	6P x 0.75	7/0.37	2.0	19.7/24.6	372


Impact Resistant

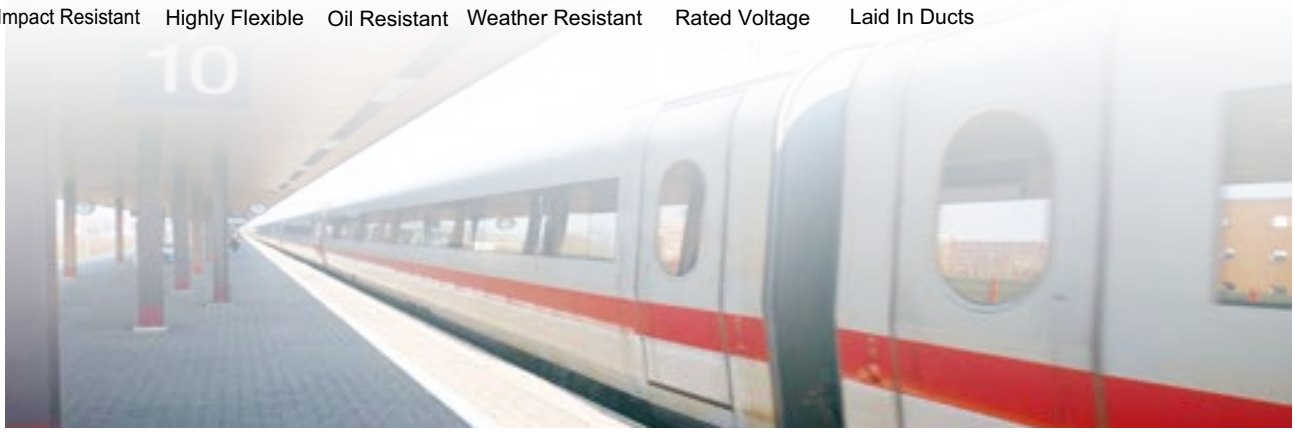

Highly Flexible


Oil Resistant


Weather Resistant

Rated Voltage


Laid In Ducts



TYPE C1 & C2 Railway Signalling Cable

Applications

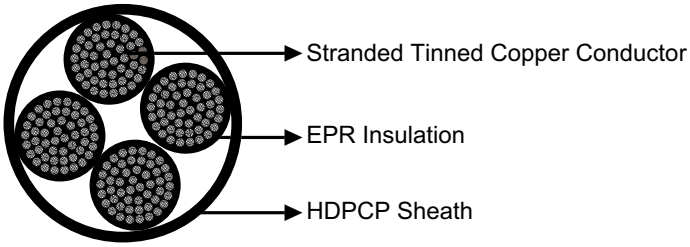
The cables are designed for railway signalling systems. The cables are suitable for use in d.c. circuits where the nominal voltage to earth does not exceed 1100 volts and installation in ducts.

Standard

- NR/PS/SIG/00005(formerly RT/E/PS/00005)

Construction

- Conductors: Tinned stranded copper, class 5 according to IEC 60228 & BS6360.
- Insulation: EPR Type GP4 to BS7655.
- Core Wrapping: Plastic tape(s) with overlapping.
- Sheath: HDPCP Type RS2 to BS7655.

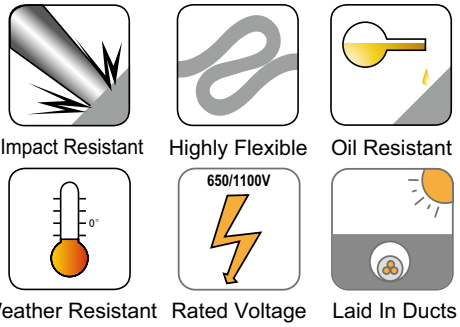


Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	2.5
Maximum DC Conductor Resistance	Ω/km	8.21
Voltage Rating	KV	0.65/1.1
Nominal Insulation Thickness	mm	1.05

Mechanical and Thermal Properties

- Minimum Bending Radius: 6xOD (static); 15xOD (dynamic)
- Temperature Range: -25℃ to +85℃ (during operation);
  -10℃ to +85℃ (during installation)



Impact Resistant | Highly Flexible | Oil Resistant

Weather Resistant | Rated Voltage | Laid In Ducts

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
		Type C1			
RS/C1-3G5G-1C2.5S	1 x 2.5	50/0.25	3.8	11.2/14.0	195
		Type C2			
RS/C2-3G5G-2C2.5S	2 x 2.5	50/0.25	3.8	14.9/18.8	370
RS/C2-3G5G-4C2.5S	4 x 2.5	50/0.25	3.8	16.4/20.9	460
RS/C2-3G5G-7C2.5S	7 x 2.5	50/0.25	3.8	18.7/23.7	610
RS/C2-3G5G-10C2.5S	10 x 2.5	50/0.25	3.8	22.5/28.6	920
RS/C2-3G5G-12C2.5S	12 x 2.5	50/0.25	3.8	23.2/29.3	950
RS/C2-3G5G-16C2.5S	16 x 2.5	50/0.25	3.8	25.3/32.0	1180

Routine test voltage: 2.5kV for 5 minute

TYPE C3 Railway Signalling Cable

Applications

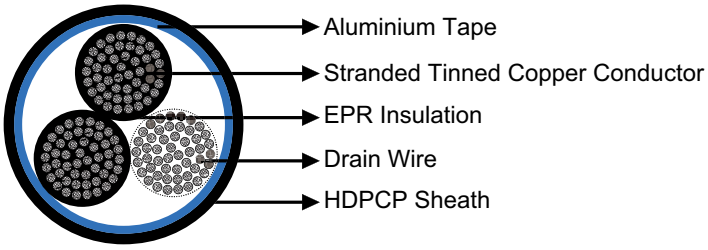
The cables are designed for railway signalling systems. The cables are suitable for use in d.c. circuits where the nominal voltage to earth does not exceed 1100 volts and installation in ducts.

Standard

- NR/PS/SIG/00005(formerly RT/E/PS/00005)

Construction

- Conductors: Tinned stranded copper, class 5 according to IEC 60228 & BS6360.
- Insulation: EPR Type GP4 to BS7655.
- Screen: Aluminium tape
- Drain wire: 2.5 mm^2 flexible tinned copper
- Sheath: HDPCP Type RS2 to BS7655.

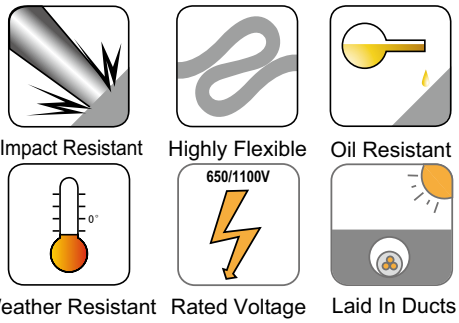


Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	2.5
Maximum DC Conductor Resistance	Ω/km	8.21
Minimum Noise Reduction	dB	60
Voltage Rating	KV	0.65/1.1
Nominal Insulation Thickness	mm	1.05

Mechanical and Thermal Properties

- Minimum Bending Radius: 6xOD (static); 15xOD (dynamic)
- Temperature Range: -25℃ to +85℃ (during operation);
  -10℃ to +85℃ (during installation)



Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
Type C3					
RS/C3-3G(St)5G-1P2.5S	1 x 2 x 2.5	50/0.25	3.8	15.0/20.0	390

Routine test voltage: 2.5kV for 5 minutes

TYPE D1 & D2 Railway Signalling Cable

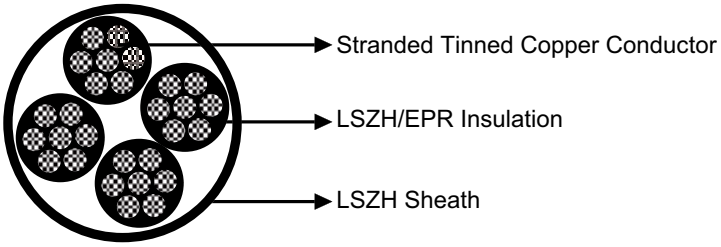
Applications

The cables are designed for railway signalling systems. The cables are suitable for use in d.c. circuits where the nominal voltage to earth does not exceed 1100 volts and installation in ducts.

Standards

- NR/PS/SIG/00005(formerly RT/E/PS/00005)

Construction



- Conductors: Tinned stranded copper, according to IEC 60228 class 2& BS6360.
- Insulation: LSZH or EPR Type GP4 to BS7655.
- Core Wrapping: Plastic tape(s) with overlapping.
- Sheath: LSZH.

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	0.75	1.5	2.5	10.0	16.0	35.0	70.0	95.0
Maximum DC Conductor Resistance	Ω/km	24.8	12.2	7.56	1.84	1.16	0.529	0.27	0.195
Voltage Rating	KV	0.65/1.1							
Nominal Insulation Thickness	mm	0.85	0.8	0.8	1.0	1.0	1.2	1.4	1.6

Mechanical and Thermal Properties

- Minimum Bending Radius: 6xOD (static); 15xOD (dynamic)
- Temperature Range: -25℃ to +85℃ (during operation); -10℃ to +85℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
Type D1					
RS/D1-3GH-1C0.75S	1 x 0.75	7/0.37	2.0	6.5/8.1	25
RS/D1-3GH-1C1.5S	1 x 1.5	7/0.53	2.0	6.8/8.5	30
RS/D1-3GH-1C2.5S	1 x 2.5	7/0.67	2.0	7.2/8.9	34
RS/D1-3GH-1C10S	1 x 10.0	7/1.35	2.0	9.4/11.8	205
RS/D1-3GH-1C35S	1 x 35.0	19/1.53	2.0	12.9/16.1	495

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
Type D2					
RS/D2-3GH-2C1.5S	2 x 1.5	7/0.53	2.0	9.4/12.1	140
RS/D2-3GH-2C2.5S	2 x 2.5	7/0.67	2.0	10.5/13.1	170
RS/D2-3GH-2C10S	2 x 10.0	7/1.35	2.0	15.0/18.7	383
RS/D2-3GH-2C16S	2 x 16.0	7/1.70	2.0	16.7/20.9	625
RS/D2-3GH-2C35S	2 x 35.0	19/1.53	2.2	22.3/27.8	994
RS/D2-3GH-2C70S	2 x 70.0	19/2.14	2.4	28.8/36.0	2121
RS/D2-3GH-2C95S	2 x 95.0	19/2.52	2.6	33.2/41.5	2760
RS/D2-3GH-4C0.75S	4 x 0.75	7/0.37	2.0	10.2/12.8	150
RS/D2-3GH-7C0.75S	7 x 0.75	7/0.37	2.0	11.8/14.7	225
RS/D2-3GH-10C0.75S	10 x 0.75	7/0.37	2.0	14.4/18.0	280
RS/D2-3GH-12C0.75S	12 x 0.75	7/0.37	2.0	14.8/18.5	321
RS/D2-3GH-19C0.75S	19 x 0.75	7/0.37	2.0	17.0/21.3	425
RS/D2-3GH-27C0.75S	27 x 0.75	7/0.37	2.0	20.1/25.1	606
RS/D2-3GH-37C0.75S	37 x 0.75	7/0.37	2.2	22.7/28.4	786
RS/D2-3GH-48C0.75S	48 x 0.75	7/0.37	2.2	25.7/32.2	972
RS/D2-3GH-4C1.5S	4 x 1.5	7/0.53	2.0	10.9/13.7	250
RS/D2-3GH-7C1.5S	7 x 1.5	7/0.53	2.0	12.6/15.8	370
RS/D2-3GH-10C1.5S	10 x 1.5	7/0.53	2.0	15.6/19.4	410
RS/D2-3GH-12C1.5S	12 x 1.5	7/0.53	2.0	16.0/20.0	410
RS/D2-3GH-19C1.5S	19 x 1.5	7/0.53	2.0	18.5/23.1	615
RS/D2-3GH-27C1.5S	27 x 1.5	7/0.53	2.2	22.2/27.8	897
RS/D2-3GH-37C1.5S	37 x 1.5	7/0.53	2.2	25.1/31.4	1126
RS/D2-3GH-48C1.5S	48 x 1.5	7/0.53	2.4	28.1/35.1	1280
RS/D2-3GH-4C2.5S	4 x 2.5	7/0.67	2.0	11.9/14.8	340
RS/D2-3GH-7C2.5S	7 x 2.5	7/0.67	2.0	13.8/17.2	500
RS/D2-3GH-10C2.5S	10 x 2.5	7/0.67	2.0	17.1/21.3	680
RS/D2-3GH-12C2.5S	12 x 2.5	7/0.67	2.0	17.6/22.0	613
RS/D2-3GH-19C2.5S	19 x 2.5	7/0.67	2.0	20.4/25.5	815
RS/D2-3GH-27C2.5S	27 x 2.5	7/0.67	2.2	24.6/30.7	1200
RS/D2-3GH-37C2.5S	37 x 2.5	7/0.67	2.4	27.8/34.7	1600
RS/D2-3GH-48C2.5S	48 x 2.5	7/0.67	2.6	31.2/39.0	1960


Impact Resistant


Highly Flexible


Oil Resistant

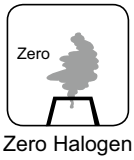
Weather Resistant

Rated Voltage


Laid In Ducts


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

TYPE E1 & E2 Railway Signalling Cable

Applications

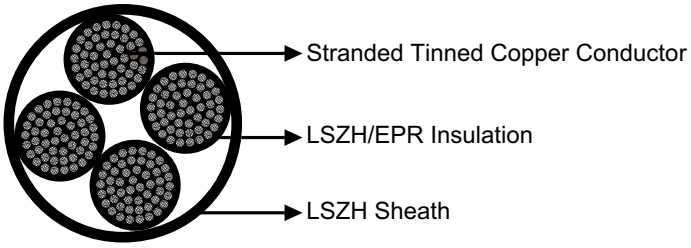
The cables are designed for railway signalling systems. The cables are suitable for use in d.c. circuits where the nominal voltage to earth does not exceed 1100 volts and installation in ducts.

Standards

- NR/PS/SIG/00005(formerly RT/E/PS/00005)

Construction

- Conductors: Tinned stranded copper, class 5 according to IEC 60228 & BS6360.
- Insulation: LSZH or EPR Type GP4 to BS7655.
- Outer Sheath: LSZH.



Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	2.5
Maximum DC Conductor Resistance	Ω/km	8.21
Voltage Rating	KV	0.65/1.1
Nominal Insulation Thickness	mm	1.05

Mechanical and Thermal Properties

- Minimum Bending Radius: 6xOD (static); 15xOD (dynamic)
- Temperature Range: -25℃ to +85℃ (during operation); -10℃ to +85℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
		Type E1			
RS/E1-3GH-1C2.5S	1 x 2.5	50/0.25	3.8	11.2/14.0	200
		Type E2			
RS/E2-3GH-2C2.5S	2 x 2.5	50/0.25	3.8	14.9/18.8	380
RS/E2-3GH-4C2.5S	4 x 2.5	50/0.25	3.8	16.4/20.9	470
RS/E2-3GH-7C2.5S	7 x 2.5	50/0.25	3.8	18.7/23.7	625
RS/E2-3GH-10C2.5S	10 x 2.5	50/0.25	3.8	22.5/28.6	940

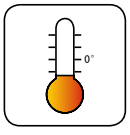
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
RS/E2-3GH-12C2.5S	12 x 2.5	50/0.25	3.8	23.2/29.3	980
RS/E2-3GH-16C2.5S	16 x 2.5	50/0.25	3.8	25.3/32.0	1200
RS/E2-3GH-1P2.5S	1 x 2 x 2.5	50/0.25	3.8	15.0/20.0	341

Routine test voltage: 2.5kV for 5 minutes


Impact Resistant


Highly Flexible


Oil Resistant



Weather Resistant

Rated Voltage


Laid In Ducts


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

TYPE E3 0.65/1.1KV Railway Signalling Cable

Applications

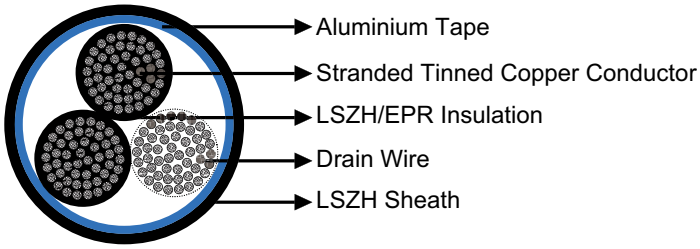
The cables are designed for railway signalling systems. The cables are suitable for use in d.c. circuits where the nominal voltage to earth does not exceed 1100 volts and installation in ducts.

Standards

- NR/PS/SIG/00005(formerly RT/E/PS/00005)

Construction

- Conductor: Tinned stranded copper, according to IEC 60228 class 5& BS6360.
- Insulation: LSZH or EPR Type GP4 to BS7655.
- Screen: Aluminium tape.
- Drain wire: 2.5 mm^2 flexible tinned copper.
- Sheath: LSZH.



Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	2.5
Maximum DC Conductor Resistance	Ω/km	8.21
Minimum Noise Reduction	dB	60
Voltage Rating	KV	0.65/1.1
Nominal Insulation Thickness	mm	1.05

Mechanical and Thermal Properties

- Minimum Bending Radius: 6xOD (static); 15xOD (dynamic)
- Temperature Range: -25℃ to +85℃ (during operation); -10℃ to +85℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
Type E3					
RS/E3-3G(St)H-1P2.5S	1 x 2 x 2.5	50/0.25	3.8	15.0/20.0	410

Routine test voltage: 2.5kV for 5 minutes


Impact Resistant


Highly Flexible


Oil Resistant

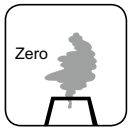

Weather Resistant

Rated Voltage


Laid In Ducts


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

EAPSP nx1x1.4

Applications

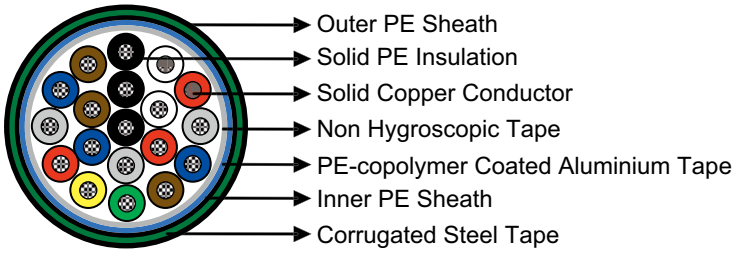
The cables are used as railway cables and can be installed directly into the ground or in ducts.

Standards

- RENFE E.T. 03.365.051.6

Construction

- Conductors: Soft annealed solid copper, 1.4 mm nominal diameter.
- Insulation: PE Insulation.
- Stranding: Cores are helically stranded in concentric layers.
- Core Wrapping: Plastic tape(s) with overlapping.



- Moisture Barrier: One laminated sheath made of aluminium tape (0.2mm thick) coated with copolymer on at least one side is applied longitudinally with overlap.
- Inner Sheath: PE sheath.
- Armour: One corrugated steel tape is longitudinally applied with overlap.
- Outer Sheath: PE sheath.

Electrical Characteristics at 20□

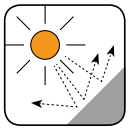
Nominal Conductor Diameter	mm	1.4
Maximum Conductor Resistance	Ω/km	11.7
Minimum Insulation Resistance @500 V DC	MΩ.km	25000
Resistance Unbalance	%	2
Test Voltage @50Hz 1min		
Core to core	V_{eff}	2100
Core to screen	V_{eff}	2500
Core to armouring	V_{eff}	2000

Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -30℃ to +70℃ (during operation); -10℃ +50℃ (during installation)

Dimensions and Weight

Cable Code	Number of Cores	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
1.4mm conductor, 2.6mm Insulated wire					
RS/EAPSP-2Y(L)2Y(SR)2Y-4C1.4	4	1.3	1.4	15.7	270
RS/EAPSP-2Y(L)2Y(SR)2Y-7C1.4	7	1.3	1.4	17.1	350
RS/EAPSP-2Y(L)2Y(SR)2Y-9C1.4	9	1.3	1.4	19.9	420
RS/EAPSP-2Y(L)2Y(SR)2Y-12C1.4	12	1.3	1.4	20.0	480
RS/EAPSP-2Y(L)2Y(SR)2Y-19C1.4	19	1.3	1.4	22.0	630
RS/EAPSP-2Y(L)2Y(SR)2Y-27C1.4	27	1.3	1.4	24.8	810
RS/EAPSP-2Y(L)2Y(SR)2Y-37C1.4	37	1.3	1.4	26.9	1010
RS/EAPSP-2Y(L)2Y(SR)2Y-48C1.4	48	1.3	1.4	29.7	1240
RS/EAPSP-2Y(L)2Y(SR)2Y-61C1.4	61	1.3	1.4	31.8	1490


UV Resistant


Water Resistant

Rated Voltage


Buried in Ground


Laid In Ducts

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

CCPSSP-FR0.3 nx1x1.4

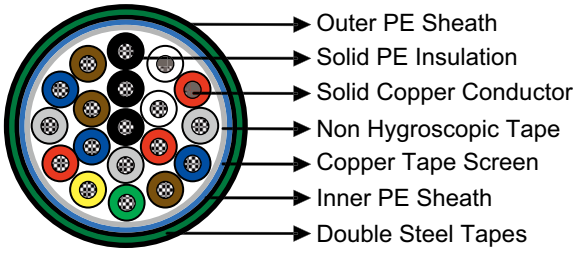
Applications

The cables are used as railway cables and can be installed directly into the ground or in ducts.

Standards

- RENFE E.T. 03.365.051.6

Construction



- Conductors: Soft annealed solid copper, 1.4 mm nominal diameter.
- Insulation: PE Insulation.
- Stranding: Cores are helically stranded in concentric layers.
- Core Wrapping: Two or more layers of plastic tape(s) with overlapping.
- Screen: Copper tapes with overlap (protection against interference).
- Inner Sheath: PE sheath.
- Armour: Two layers of steel tape (0.8mm thick).
- Outer Sheath: PE sheath.

Electrical Characteristics at 20□

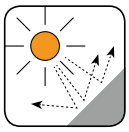
Nominal Conductor Diameter	mm	1.4
Maximum Conductor Resistance	Ω/km	11.9
Minimum Insulation Resistance @500 V DC	MΩ.km	15000
Resistance Unbalance	%	2
Test Voltage @50Hz 1min		
Core to core	V_{eff}	2100
Core to screen	V_{eff}	2500
Reduction Factor (f=50Hz)		0.3

Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

Cable Code	Number of Cores	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
1.4mm conductor, 2.6mm Insulated wire					
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-2C1.4	2	1.5	1.6	16.5	530
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-4C1.4	4	1.5	1.6	17.5	608
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-7C1.4	7	1.5	1.6	19.0	718
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-9C1.4	9	1.5	1.6	22.7	914
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-12C1.4	12	1.5	1.6	23.2	977
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-19C1.4	19	1.6	1.8	25.2	1185
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-27C1.4	27	1.6	1.8	28.1	1437
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-37C1.4	37	1.7	1.8	31.4	1754
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-48C1.4	48	1.7	1.8	34.2	2062


UV Resistant


Water Resistant

Rated Voltage


Buried in Ground


Laid In Ducts

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Anti Induction

CCTSST-FR0.3 nx1x1.4

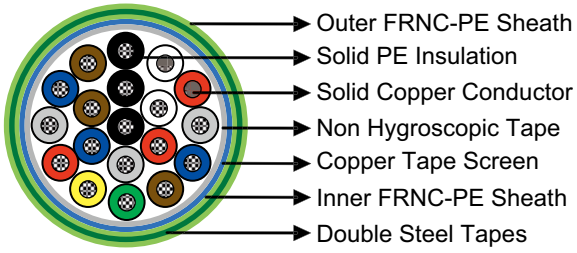
Applications

The cables are used as railway cables and can be installed directly into the ground or in ducts.

Standards

- RENFE E.T. 03.365.051.6

Construction



- Conductors: Soft annealed solid copper, 1.4 mm nominal diameter.
- Insulation: PE Insulation.
- Stranding: Cores are helically stranded in concentric layers.
- Core Wrapping: Two or more layers of plastic tape(s) with overlapping.
- Screen: Copper tapes with overlap (protection against interference).
- Inner Sheath: FRNC-PE sheath, coloured green.
- Armour: Two layers of steel tape (0.8mm thick).
- Outer Sheath: FRNC-PE sheath, coloured green.

*FRNC: Flame retardant, non corrosive.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	1.4
Maximum Conductor Resistance	Ω/km	11.7
Minimum Insulation Resistance @500 V DC	MΩ.km	35000
Resistance Unbalance	%	2
Test Voltage @50Hz 1min		
Core to core	V_{eff}	2100
Core to screen	V_{eff}	2500
Reduction Factor (f=50Hz)		0.3

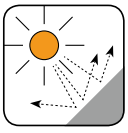
Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

Cable Code	Number of Cores	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
1.4mm conductor, 2.6mm Insulated wire					
RS/CCTSST-FR0.3-2Y(K)HBH-4C1.4	4	1.5	1.6	18.0	705
RS/CCTSST-FR0.3-2Y(K)HBH-19C1.4	19	1.6	1.8	26.1	1362
RS/CCTSST-FR0.3-2Y(K)HBH-27C1.4	27	1.6	1.8	29.2	1648
RS/CCTSST-FR0.3-2Y(K)HBH-48C1.4	48	1.7	1.8	36.7	2348

Anti Induction


UV Resistant


Water Resistant

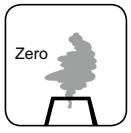
Rated Voltage


Buried in Ground


Laid In Ducts


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

AJ-2Y(L)2YDB2Y S(H45)

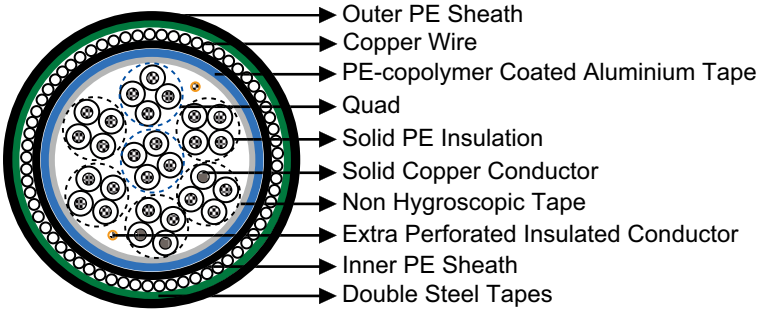
Applications

The cables are designed for transmission of low frequent signals up to 90 KHz through symmetric circuits in railway networks, and are suitable for laying directly into the ground or in ducts.

Standards

- Dlk 1.013.109y
- Dlk 1.013.110y

Construction



- Conductors: Solid Annealed copper, 0.9 or 1.4 mm nominal diameter.
- Insulation: Solid polyethylene.
- Cabling Element: Four insulated conductors are twisted together to form a quad.
- Stranding: Quads are helically stranded in concentric layers. Cables from 7 quads on, have two extra conductors of 0.5mm with perforated insulation (surveillance conductors).
- Core Wrapping: Plastic tape(s) with overlapping.
- Moisture Barrier: One laminated sheath made of aluminium tape (0.15mm) coated with PE-Copolymer on at least one side is applied with longitudinally overlap.
- Inner Sheath: Low density polyethylene.
- Electrostatic Shield: One layer of helically applied copper wires (0.9, 1.2, 1.4 or 1.8mm).
- Electromagnetic Shield: Two helically applied steel tapes (0.5 or 0.8mm thick, depending on required reduction factor).
- Outer Sheath: Low density polyethylene.

Type Codes

AJ–	outdoor cable	2Y	solid PE conductor insulation
(L)2Y	inner laminated PE sheath		
D	copper wire concentric screen		
B	steel tape armor		
2Y	outer PE sheath		
S	signal cable		

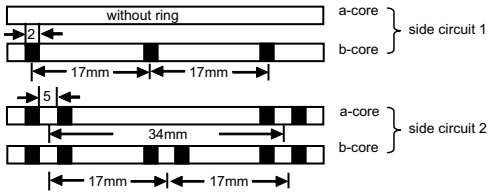
LG layer stranding

H(n) operating capacity

Ring marking of Quad

The single core is identified by black ring markings:

Side Circuit 1	a-wire	without marking
	b-wire	1 mark distance 17mm
Side Circuit 2	a-wire	2 marks distance 34mm
	b-wire	2 marks distance 17mm



Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.9	1.4
Maximum Conductor Resistance	Ω/km	56.6	23.4
Minimum Insulation Resistance @500 V DC (1min)	MΩ.km	10000	10000
Maximum Conductor Capacitance @800Hz (AC)	nF/km	45	45
Maximum Capacitance Unbalance @800Hz			
K_1 (100% / 50% all values)	pF/km	650/150	650
$K_{9\text{-}12}$ neighboured quads	pF/km	500/150	500
$K_{9\text{-}12}$ over-neighboured quads	pF/km	150	150
$Ea_{1/2}$	pF/km	1300	1300
Miniumum Far-end Crosstalk Attenuation @90KHz			
100% / 80% all values	dB/km	58/62	33
Maximum Attenuation @90KHz	dB/km	3.3	2.6
Dielectric Strength, conductor to conductor (DC voltage 1min)	V	3535	3535
Surveillance Conductors			
Loop resistance, maximum	Ω/km	190	190
Insulation resistance			
- dry cable core, minimum	MΩ.km	1000	1000
- wet cable core, maximum	KΩ.km	30	30
Optional: Nominal Reduction Factor @ 100 V/km, 16 2/3 Hz			
rk 401 series		0.15	0.15
rk 501 series		0.35	0.35
rk 601 series		0.55	0.55
Operating Voltage AC/DC	V	420/600	420/600
Test Voltage 50 Hz 1 min			
Core to Core	V_{eff}	2500	2500
Core to Screen	V_{eff}	2500	2500

Mechanical and Thermal Properties

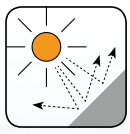
- Minimum Bending Radius: 10xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

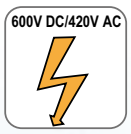
Cable Code	Number of Quads	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.9mm conductor, 1.8mm Insulated wire rk 601 Series					
RS109y-2Y(L)2YDB2Y-3Q0.9-S(H45)-R6	3	1.3	1.2	21.0	650
RS109y-2Y(L)2YDB2Y-5Q0.9-S(H45)-R6	5	1.3	1.2	23.0	800
RS109y-2Y(L)2YDB2Y-10Q0.9-S(H45)-R6	10	1.3	1.2	28.0	1130

Cable Code	Number of Quads	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
RS109y-2Y(L)2YDB2Y-20Q0.9-S(H45)-R6	20	1.3	1.2	35.0	1670
RS109y-2Y(L)2YDB2Y-30Q0.9-S(H45)-R6	30	1.3	1.2	40.0	2180
RS109y-2Y(L)2YDB2Y-40Q0.9-S(H45)-R6	40	1.3	1.2	45.0	2650
0.9mm conductor, 1.8mm Insulated wire rk 401 Series					
RS109y-2Y(L)2YDB2Y-10Q0.9-S(H45)-R4	10	1.3	1.2	31.0	1880
RS109y-2Y(L)2YDB2Y-20Q0.9-S(H45)-R4	20	1.3	1.2	38.0	2640
RS109y-2Y(L)2YDB2Y-30Q0.9-S(H45)-R4	30	1.3	1.2	43.0	3310
RS109y-2Y(L)2YDB2Y-40Q0.9-S(H45)-R4	40	1.3	1.2	48.0	3880
1.4mm conductor, 2.6mm Insulated wire rk 501 Series					
RS109y-2Y(L)2YDB2Y-3Q1.4-S(H45)-R5	3	1.3	1.2	25.0	1060
RS109y-2Y(L)2YDB2Y-5Q1.4-S(H45)-R5	5	1.3	1.2	29.0	1360
RS109y-2Y(L)2YDB2Y-10Q1.4-S(H45)-R5	10	1.3	1.2	37.0	2040
RS109y-2Y(L)2YDB2Y-20Q1.4-S(H45)-R5	20	1.3	1.2	47.0	3180
RS109y-2Y(L)2YDB2Y-30Q1.4-S(H45)-R5	30	1.3	1.2	54.0	4220
RS109y-2Y(L)2YDB2Y-40Q1.4-S(H45)-R5	40	1.3	1.2	61.0	5180
1.4mm conductor, 2.6mm Insulated wire rk 401 Series					
RS109y-2Y(L)2YDB2Y-3Q1.4-S(H45)-R4	3	1.3	1.2	28.0	1650
RS109y-2Y(L)2YDB2Y-5Q1.4-S(H45)-R4	5	1.3	1.2	31.0	1950
RS109y-2Y(L)2YDB2Y-10Q1.4-S(H45)-R4	10	1.3	1.2	39.0	2880
RS109y-2Y(L)2YDB2Y-20Q1.4-S(H45)-R4	20	1.3	1.2	49.0	4180
RS109y-2Y(L)2YDB2Y-30Q1.4-S(H45)-R4	30	1.3	1.2	56.0	5330
RS109y-2Y(L)2YDB2Y-40Q1.4-S(H45)-R4	40	1.3	1.2	63.0	6430

Anti Induction


UV Resistant


Water Resistant



Rated Voltage


Laid In Ducts


Buried in Ground

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

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

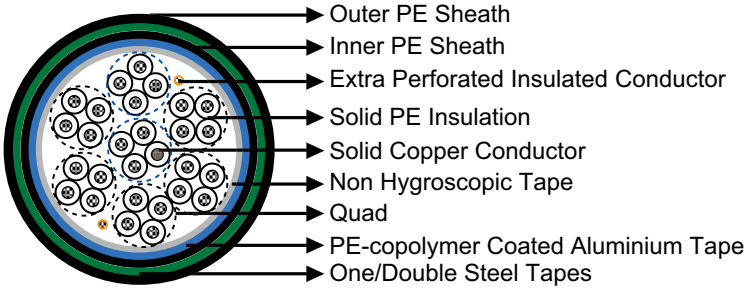
Applications

The cables are designed for transmission of low frequent signals up to 90 KHz through symmetric circuits in railway networks, and are suitable for laying directly into the ground or in ducts.

Standards

- Dlk 1.013.109y
- Dlk 1.013.110y

Construction



- Conductor: Solid annealed copper, 0.9 or 1.4 mm nominal diameter.
- Insulation: Solid polyethylene.
- Cabling Element: Four insulated conductors are twisted together to form a quad.
- Stranding: Quads are helically stranded in concentric layers. Cables from 7 quads on, have two extra conductors of 0.5mm with perforated insulation (surveillance conductors).
- Core Wrapping: Plastic tape(s) with overlapping.
- Moisture Barrier: One laminated sheath made of aluminium tape (0.15mm) coated with PE-Copolymer on at least one side is applied with longitudinally overlap.
- Inner Sheath: Low density polyethylene.
- Electromagnetic Shield: One helically applied steel tape (0.2-0.3mm) or two helically applied steel tapes (0.1mm).
- Outer sheath: Low density polyethylene.

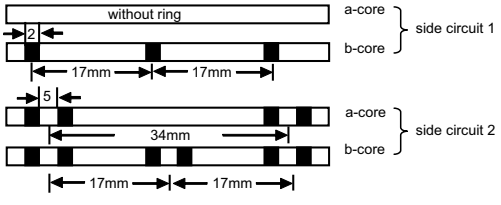
Type Codes

A–	outdoor cable	2Y	solid PE conductor insulation
(L)2Y	PE inner laminated sheath		
B	steel tape armor		
2Y	PE outer sheath		
S	signal cable		
LG	layer stranding		
H(n)	operating capacity		

Ring marking of Quad

The single core is identified by black ring markings:

Side Circuit 1	a-wire	without marking
	b-wire	1 mark distance 17mm
Side Circuit 2	a-wire	2 marks distance 34mm
	b-wire	2 marks distance 17mm



Electrical Characteristics at 20□

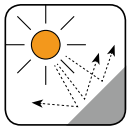
Nominal Conductor Diameter	mm	0.9	1.4
Maximum Conductor Resistance	Ω/km	56.6	23.4
Minimum Insulation Resistance @500 V DC (1min)	MΩ.km	10000	10000
Maximum Conductor Capacitance @800Hz (AC)	nF/km	45	45
Maximum Capacitance unbalance @800Hz			
K_1 (100% / 50% all values)	pF/km	650/150	650
$K_{9\text{-}12}$ neighboured quads	pF/km	500/150	500
$K_{9\text{-}12}$ over-neighboured quads	pF/km	150	150
$Ea_{1/2}$	pF/km	1300	1300
Minimum Far-end Crosstalk Attenuation @90KHz			
100% / 80% all values	dB/km	58/62	33
Maximum Attenuation @90KHz	dB/km	3.3	2.6
Dielectric Strength, conductor to conductor (DC voltage 1min)	V	3535	3535
Surveillance Conductors			
Loop resistance, maximum	Ω/km	190	190
Insulation resistance			
- dry cable core, minimum	MΩ.km	1000	1000
- wet cable core, maximum	KΩ.km	30	30
Operating Voltage AC/DC	V	420/600	420/600
Test Voltage 50 Hz 1 min			
Core to Core	V_{eff}	2500	2500
Core to Screen	V_{eff}	2500	2500

Mechanical and Thermal Properties

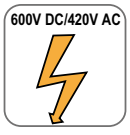
- Minimum Bending Radius: 10XOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

Cable Code	Number of Quads	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.9mm conductor, 1.8mm Insulated wire					
RS109y-2Y(L)2YB2Y-1Q0.9-S(H45)	1	1.3	1.2	12.0	170
RS109y-2Y(L)2YB2Y-3Q0.9-S(H45)	3	1.3	1.2	17.0	310
RS109y-2Y(L)2YB2Y-5Q0.9-S(H45)	5	1.3	1.2	19.0	410
RS109y-2Y(L)2YB2Y-7Q0.9-S(H45)	7	1.3	1.2	21.0	500
RS109y-2Y(L)2YB2Y-10Q0.9-S(H45)	10	1.3	1.2	24.0	640
RS109y-2Y(L)2YB2Y-14Q0.9-S(H45)	14	1.3	1.2	27.0	800
1.4mm conductor, 2.8mm Insulated wire					
RS109y-2Y(L)2YB2Y-1Q1.4-S(H45)	1	1.3	1.2	14.0	240
RS109y-2Y(L)2YB2Y-3Q1.4-S(H45)	3	1.3	1.2	21.0	490
RS109y-2Y(L)2YB2Y-5Q1.4-S(H45)	5	1.3	1.2	24.0	710
RS109y-2Y(L)2YB2Y-7Q1.4-S(H45)	7	1.3	1.2	26.0	880
RS109y-2Y(L)2YB2Y-10Q1.4-S(H45)	10	1.3	1.2	33.0	1190
RS109y-2Y(L)2YB2Y-14Q1.4-S(H45)	14	1.3	1.2	36.5	1550


UV Resistant

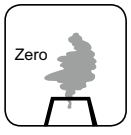

Water Resistant



Rated Voltage


Laid In Ducts


Buried in Ground



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

A-2Y(L)2Yv S(H45)

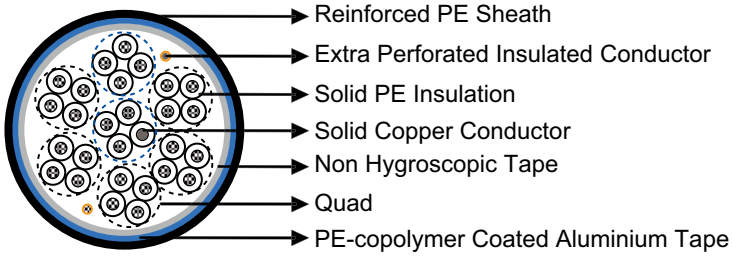
Applications

The cables are designed for transmission of low frequent signals up to 90 KHz through symmetric circuits in railway networks, and are suitable for laying directly into the ground or in ducts.

Standards

- Dlk 1.013.109y
- Dlk 1.013.110y

Construction



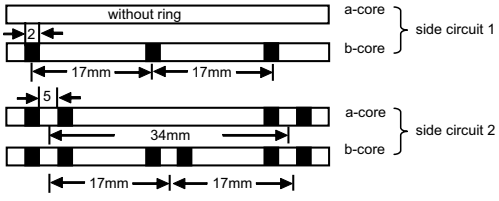
- Conductors: Solid annealed copper, 0.9 or 1.4 mm nominal diameter.
- Insulation: Solid polyethylene.
- Cabling Element: Four insulated conductors are twisted together to form a quad.
- Stranding: Quads are helically stranded in concentric layers. Cables from 7 quads on, have two extra conductors of 0.5mm with perforated insulation (surveillance conductors).
- Core Wrapping: Plastic tape(s) with overlapping.
- Moisture Barrier: One laminated sheath made of aluminium tape (0.15mm) coated with PE-Copolymer on at least one side is applied with longitudinally overlap.
- Outer Sheath: Polyethylene, with reinforced radial thickness.

Type Codes

A–	outdoor cable
2Y	solid PE conductor insulation
(L)2Yv	laminated sheath with increased wall thickness
S	signal cable
LG	layer stranding
H(n)	operating capacity

Ring marking of Quad

The single core is identified by black ring markings:



Side Circuit 1	a-wire	without marking
	b-wire	1 mark distance 17mm
Side Circuit 2	a-wire	2 marks distance 34mm
	b-wire	2 marks distance 17mm

Electrical Characteristics at 20□

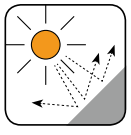
Nominal Conductor Diameter	mm	0.9	1.4
Maximum Conductor Resistance	Ω/km	56.6	23.4
Minimum Insulation Resistance @500 V DC (1min)	MΩ.km	10000	10000
Maximum Conductor Capacitance @800Hz (AC)	nF/km	45	45
Maximum Capacitance Unbalance @800Hz			
K_1 (100% / 50% all values)	pF/km	650/150	650
$K_{9\text{-}12}$ neighboured quads	pF/km	500/150	500
$K_{9\text{-}12}$ over-neighboured quads	pF/km	150	150
$Ea_{1/2}$	pF/km	1300	1300
Minimum Far-end Crosstalk Attenuation @90KHz			
100% / 80% all values	dB/km	58/62	33
Maximum Attenuation @90KHz	dB/km	3.3	2.6
Dielectric Strength, conductor to conductor (DC voltage 1min)	V	3535	3535
Surveillance Conductors			
Loop resistance, maximum	Ω/km	190	190
Insulation resistance			
- dry cable core, minimum	MΩ.km	1000	1000
- wet cable core, maximum	KΩ.km	30	30
Operating Voltage AC/DC	V	420/600	420/600
Test Voltage 50 Hz 1 min			
Core to Core	V_{eff}	2500	2500
Core to Screen	V_{eff}	2500	2500

Mechanical and Thermal Properties

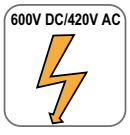
- Minimum Bending Radius: 7.5xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

Cable Code	Number of Quads	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
0.9mm conductor, 1.8mm Insulated wire				
RS109y-2Y(L)2Yv-1Q0.9-S(H45)	1	2.0	10.0	95
RS109y-2Y(L)2Yv-3Q0.9-S(H45)	3	2.0	15.0	200
RS109y-2Y(L)2Yv-5Q0.9-S(H45)	5	2.0	17.0	280
RS109y-2Y(L)2Yv-7Q0.9-S(H45)	7	2.0	19.0	360
RS109y-2Y(L)2Yv-10Q0.9-S(H45)	10	2.0	22.0	480
RS109y-2Y(L)2Yv-14Q0.9-S(H45)	14	2.0	25.0	620
RS109y-2Y(L)2Yv-20Q0.9-S(H45)	20	2.0	28.0	830
RS109y-2Y(L)2Yv-30Q0.9-S(H45)	30	2.2	34.0	1200
RS109y-2Y(L)2Yv-40Q0.9-S(H45)	40	2.2	38.0	1550
1.4mm conductor, 2.8mm Insulated wire				
RS109y-2Y(L)2Yv-1Q1.4-S(H45)	1	2.0	12.0	150
RS109y-2Y(L)2Yv-3Q1.4-S(H45)	3	2.0	19.0	350
RS109y-2Y(L)2Yv-5Q1.4-S(H45)	5	2.0	22.0	530
RS109y-2Y(L)2Yv-7Q1.4-S(H45)	7	2.0	24.0	690
RS109y-2Y(L)2Yv-10Q1.4-S(H45)	10	2.0	29.0	950
RS109y-2Y(L)2Yv-14Q1.4-S(H45)	14	2.2	33.0	1280
RS109y-2Y(L)2Yv-20Q1.4-S(H45)	20	2.2	39.0	1750
RS109y-2Y(L)2Yv-30Q1.4-S(H45)	30	2.2	46.0	2550
RS109y-2Y(L)2Yv-40Q1.4-S(H45)	40	2.2	53.0	3320


UV Resistant

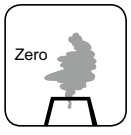

Water Resistant



Rated Voltage


Laid In Ducts


Buried in Ground



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

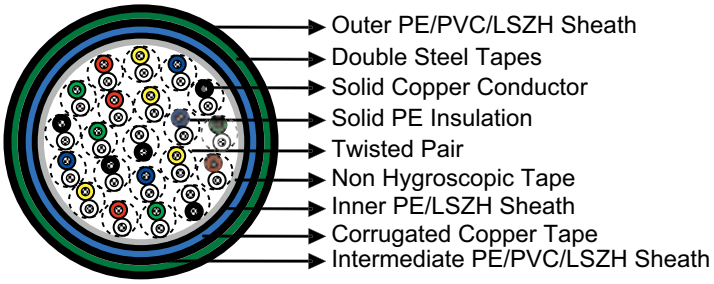
ZPAU & ZPAU-SH Main Signalling Cables (AC Electrified Lines)

Applications

The cables are designed for connection between traffic control centers and equipment shelters along the trackside. The cables are specially designed to give good induction protection (R.F= 0.26 at inductive voltage 100V/km) and are suitable for installation in intercity railways electrified at 25KV ac.

Standards

- SNCF CT 445 / SNCT ST 698G
- NF F 55-698



Construction

- Conductors：Solid annealed copper, 1.0/1.5 mm sq nominal cross section area
- Insulation：Solid polyethylene.
- Cabling Element：Each two conductors are twisted together to form a pair.
- Stranding：Pairs are helically stranded in layers to form the cable core.
- Core Wrapping：Plastic tape(s) with overlapping.
- Inner Sheath：PE sheath. LSZH FR option can be offered upon request to NF C 32 070.2.2 (C1).
- Electrostatic Shield：One corrugated copper tape.
- Intermediate Sheath：PE/PVC sheath. LSZH FR option can be offered upon request to NF C 32 070.2.2 (C1).
- Electromagnetic Shield：Two helically applied steel tapes of 0.5mm.
- Outer Sheath：PE/PVC compound. LSZH FR option can be offered upon request to NF C 32 070.2.2 (C1).
- Remarks: ZPAU: PE/PVC Sheath; ZPAU-SH: LSZH Sheath.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	1.13	1.38
Nominal Cross Section Area	mm sq	1.0	1.5
Maximum Conductor Resistance (DC)	Ω/km	18.1	12.31
Minimum Insulation Resistance @500 V DC (3mins)	MΩ.km	5000	5000
Maximum Mutual Capacitance @1000Hz (AC)	nF/km	55	55
Maximum Capacitance Unbalance (pair to pair) @800Hz			
100% cases	pF/500 m	400	400
90% cases	pF/500 m	200	200
Attenuation @45KHz	dB/km	2.5	2.5
Characteristic Impedance @45KHz	Ω	120	120
Dielectric Strength, conductor to conductor (DC voltage 3secs)	V	4500	4500
Operating Voltage (AC/DC)	V	450/750	450/750
peak value (AC)	V	900	900

Mechanical and Thermal Properties

- Minimum Bending Radius: 8xOD (static); 16xOD (dynamic)
- Temperature Range: -40℃ to +70℃ (during operation); -20℃ to +50℃ (during installation)

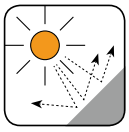
Reduction Factor

Inductive Voltage (V/km) Em	28	32	37	42	47	50	70	80	100	120	170	225
Reduction Factor @50Hz Rk	0.75	0.70	0.60	0.50	0.40	0.35	0.30	0.28	0.26	0.25	0.24	0.25

Dimensions and Weight

Cable Code	No. of Pairs	Nominal Sheath Thickness mm			Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Interm.	Outer		
1.13mm conductor, 2.3mm Insulated Wire						
RS/ZPAU-2Y2Y(K)2YB2Y-1P1S	1	1.0	0.8	1.6	16.2	490
RS/ZPAU-2Y2Y(K)2YB2Y-2P1S	2	1.0	0.8	1.6	17.0	550
RS/ZPAU-2Y2Y(K)2YB2Y-3P1S	3	1.0	0.8	1.6	22.2	820
RS/ZPAU-2Y2Y(K)2YB2Y-4P1S	4	1.0	0.8	1.6	23.8	890
RS/ZPAU-2Y2Y(K)2YB2Y-7P1S	7	1.0	0.8	1.7	26.7	1080
RS/ZPAU-2Y2Y(K)2YB2Y-14P1S	14	1.2	0.8	1.8	32.3	1560
RS/ZPAU-2Y2Y(K)2YB2Y-21P1S	21	1.2	1.1	2.0	37.2	1990
RS/ZPAU-2Y2Y(K)2YB2Y-28P1S	28	1.2	1.1	2.2	41.4	2380
RS/ZPAU-2Y2Y(K)2YB2Y-56P1S	56	1.3	1.3	2.5	52.9	3700
1.38mm conductor, 2.55mm Insulated Wire						
RS/ZPAU-2Y2Y(K)2YB2Y-14P1.5S	14	1.2	0.8	1.8	35.0	2050
RS/ZPAU-2Y2Y(K)2YB2Y-21P1.5S	21	1.2	1.1	2.0	39.5	2525

Anti Induction


UV Resistant


Mineral Oil Resistant

Rated voltage


Buried in Ground


Laid In Ducts

PE Sheath

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

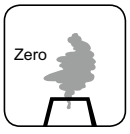
PVC Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

LSZH Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

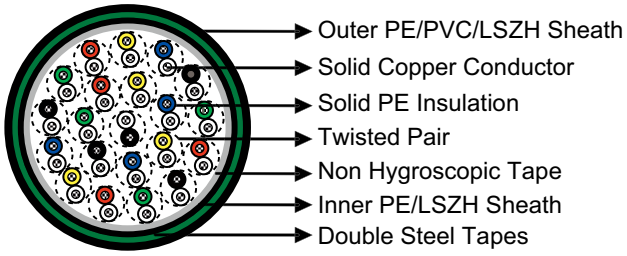
ZPFU & ZPFU-SH Main & Local Signalling Cables (Ordinary Non-Electrified or DC Electrified Lines)

Applications

The cables are designed for the main signalling circuits of 1500V DC electrified lines.

Standards

- SNCF CT 445
- NF F 55-698



Construction

- Conductors：Solid annealed copper, 1.0mm sq nominal cross section area.
- Insulation：Solid polyethylene.
- Cabling Element：Two conductors are twisted to form a pair.
- Stranding：Pairs are helically stranded to form the cable core.
- Core Wrapping：Plastic tape(s) with overlapping.
- Inner Sheath：PE. LSZH FR option can be offered upon request to NF C 32 070.2.2 (C1).
- Mechanical Protection：Two helically applied steel tapes (0.15, 0.2/0.5mm, depending on pair count).
- Outer Sheath：PE/PVC. LSZH FR option can be offered upon request to NF C 32 070.2.2 (C1).
- Remark: ZPFU: PE/PVC Sheath; ZPFU-SH: LSZH Sheath.

Electrical Characteristics at 20□

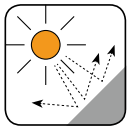
Nominal Conductor Diameter	mm	1.13
Nominal Cross Section Area	mm sq	1
Maximum Conductor Resistance (DC)	Ω/km	18.1
Minimum Insulation Resistance @500 V DC (3mins)	MΩ.km	5000
Maximum Mutual Capacitance (AC) @1000Hz	nF/km	55
Maximum Capacitance Unbalance @1000Hz	pF/500 m	400
Attenuation @45KHz	dB/km	2.5
Characteristic Impedance @45KHz	Ω	120
Dielectric Strength, conductor to conductor (DC voltage 3mins)	V	4500
Operating voltage AC/DC	V	450/750

Mechanical and Thermal Properties

- Minimum Bending Radius: 8xOD (static); 16xOD (dynamic)
- Temperature Range: -40℃ to +70℃ (during operation); -20℃ to +50℃ (during installation)

↘ Dimensions and Weight

Cable Code	No. of Pairs	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km	Armour Thickness mm
		Inner	Outer			
1.13mm Conductor, 2.3 Insulated Wire						
RS/ZPFU-2Y2YB2Y-1P1S	1	1.0	1.5	11.7	207	0.15
RS/ZPFU-2Y2YB2Y-2P1S	2	1.0	1.5	12.9	257	0.2
RS/ZPFU-2Y2YB2Y-4P1S	4	1.0	1.6	16.8	509	0.2
RS/ZPFU-2Y2YB2Y-7P1S	7	1.0	1.7	19.0	653	0.5
RS/ZPFU-2Y2YB2Y-14P1S	14	1.2	1.8	24.1	1011	0.5
RS/ZPFU-2Y2YB2Y-21P1S	21	1.2	2.0	27.8	1304	0.5
RS/ZPFU-2Y2YB2Y-28P1S	28	1.2	2.2	31.0	1594	0.5
RS/ZPFU-2Y2YB2Y-56P1S	56	1.3	2.5	40.5	2630	0.5


UV Resistant

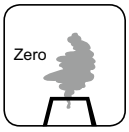

Mineral Oil Resistant

Rated voltage


Buried in Ground


Laid In Ducts

PE Sheath



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

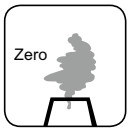
PVC Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

LSZH Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

ZPGU Local Signalling Cables (Ordinary Non-Electrified Lines)

Applications

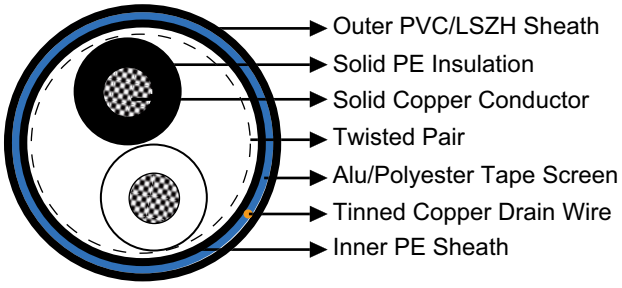
The cables are designed for internal connection inside cabling of equipment shelters along the trackside. The shielded cables are suitable for local circuits.

Standards

- SNCF CT 445
- NF F 55-698

Construction

- Conductors: Class 1 solid copper, 1.0 mm sq nominal cross section area.
- Insulation: Solid polyethylene.
- Cabling Element: Each two conductors are twisted together to form a pair.
- Inner Sheath: PE.
- Screen: Aluminium/Polyethylene tape screen
- Drain Wire: Tinned copper drain wire.
- Outer Sheath: PVC/LSZH.



Electrical Characteristics at 20□

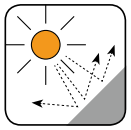
Nominal Conductor Diameter	mm	1.13
Nominal Cross Section Area	mm sq	1.0
Maximum Conductor Resistance (DC)	Ω/km	18.1
Maximum Mutual Capacitance @1000Hz (AC)	nF/km	55
Operating Voltage	V	750

Mechanical and Thermal Properties

- Minimum Bending Radius: 8xOD (static); 16xOD (dynamic)
- Temperature Range: -40℃ to +70℃ (during operation); -20℃ to +50℃ (during installation)

Dimensions and Weight

Cable Code	No. of Pairs	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
1.13mm Conductor, 2.3 Insulated Wire					
RS/ZPGU-2Y2Y(L)Y-1P1S	1	1.0	1.5	9.8	95
RS/ZPGU-2Y2Y(L)Y-2P1S	2	1.0	1.5	10.6	130
RS/ZPGU-2Y2Y(L)Y-3P1S	3	1.0	1.5	13.2	179
RS/ZPGU-2Y2Y(L)Y-7P1S	7	1.0	1.7	18.3	301
RS/ZPGU-2Y2Y(L)Y-14P1S	14	1.2	1.8	21.3	532


UV Resistant


Mineral Oil Resistant

Rated voltage


Buried in Ground


Laid In Ducts

PVC Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

LSZH Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

ZCO3 Main Signalling Cables (AC Electrified High Speed Lines)

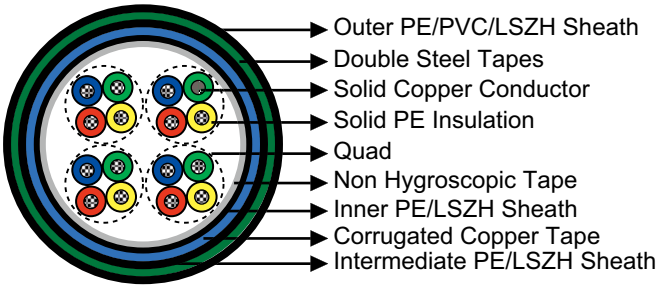
Applications

The cables are designed for connection between traffic control centers and equipment shelters along the trackside. The cables are specially designed to give good induction protection (R.F=0.21 at inductive voltage 100V/km) and are suitable for installation in high speed railway lines electrified at 25KV ac.

Standards

- SNCF CT 445
- NF F 55-698

Construction



- Conductors: Solid annealed copper, 1.0 mm sq nominal cross section area.
- Insulation: Solid polyethylene.
- Cabling Element: Four conductors are twisted to form a quad.
- Stranding: Quads are helically stranded to get the cable core.
- Core Wrapping: Plastic tape(s) with overlapping.
- Inner Sheath: Low density polyethylene. LSZH FR option can be offered upon request to NF C 32 070.2.2 (C1).
- Electrostatic Shield: Corrugated copper tape.
- Intermediate Sheath: Low density polyethylene. LSZH FR option can be offered upon request to NF C 32 070.2.2 (C1).
- Electromagnetic Shield: Two helically applied steel tapes (0.5mm).
- Outer Sheath: PE/PVC compound. LSZH FR option can be offered upon request to NF C 32 070.2.2 (C1).
- Remarks: ZCO3: PE/PVC Sheath; ZCO3-SH: LSZH Sheath.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	1.13
Nominal Cross Section Area	mm sq	1.0
Maximum Conductor Resistance (DC)	Ω/km	18.1
Minimum Insulation Resistance @500 V DC (3mins)	MΩ.km	5000
Maximum Mutual Capacitance (AC) @1000Hz	nF/km	40
Maximum Capacitance Unbalance @800Hz	pF/500 m	400
Dielectric Strength, conductor to conductor (DC voltage 3mins)	V	4500
Operating Voltage AC/DC	V	450/750

Reduction Factor

Inductive voltage(V/km)	50	70	100	370	400	470
Reduction factor @50Hz	0.42	0.30	0.21	0.16	0.18	0.31

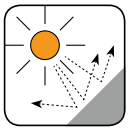
Mechanical and Thermal Properties

- Minimum Bending Radius: 8xOD (static); 16xOD (dynamic)
- Temperature Range: -40℃ to +70℃ (during operation); -20℃ to +50℃ (during installation)

Dimensions and Weight

Cable Code	No. of Quads	Nominal Sheath Thickness mm			Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Interm.	Outer		
1.13mm Conductor, 2.33 Insulated Wire						
RS/ZCO3-2Y2Y(K)2YB2Y-2Q1S	2	0.8	1.0	1.6	27.0	1295
RS/ZCO3-2Y2Y(K)2YB2Y-4Q1S	4	0.8	1.0	1.6	29.5	1490

Anti Induction


UV Resistant

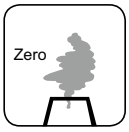

Mineral Oil Resistant

Rated voltage


Buried in Ground


Laid In Ducts

PE Sheath



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

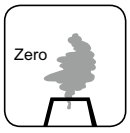
PVC Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

LSZH Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

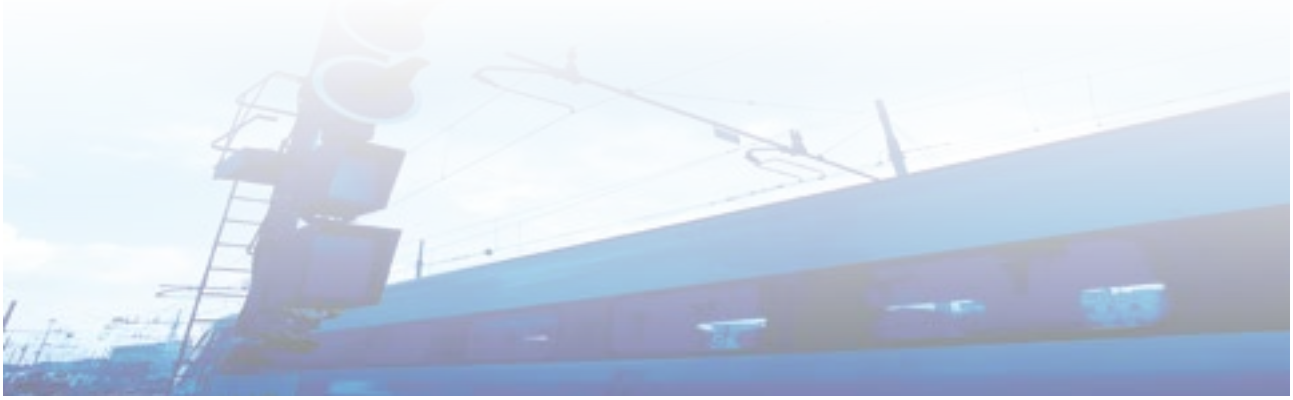


Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity



K23 LSZH Subway Signalling Cables for Metro/Local Trains/Tramlines

Applications

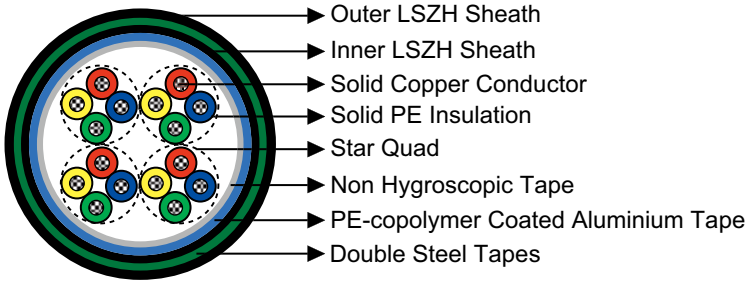
The cables are designed for remote control and teletransmission in underground railway networks. The cables can be laid in channel, cable tray, or on hook supports, along suburban railway lines electrified at maximum 1500V DC.

Standards

- NF F 55-623

Construction

- Conductors: Copper wire, 0.6, 0.8, 1.0 or 1.2 mm nominal diameter.
- Insulation: Solid polyethylene.
- Cabling Element: Four conductors are twisted to form a star quad. For 1 & 4 pair cables, conductors shall be twisted in pairs
- Stranding: Quads are stranded in helically laid concentric layers or units to form the cable core.



- Core wrapping: Plastic tape(s) with overlapping.
- Moisture barrier: One laminated sheath made of aluminium tape coated with PE-Copolymer on at least one side is applied with longitudinally overlap.
- Inner sheath: LSZH fire retardant compound.
- Armour: Two helically applied steel tapes.
- Outer sheath: LSZH fire retardant compound.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.6	0.8	1.0	1.2
Maximum Average DC Conductor Resistance	Ω/km	64.0	36.0	23.0	16.0
Minimum Insulation Resistance @500 V DC (3min)	MΩ.km	5000	5000	5000	5000
Maximum Mutual Capacitance @1000Hz (AC)	nF/km	57.5	57.5	57.5	57.5
Maximum Capacitance Unbalance @800Hz					
k_1 (side to side)	pF/500m	435	435	435	435
$K_{9\text{-}12}$ (quad to quad)	pF/500m	220	220	220	220
Operating Voltages	V	200	400	500	750
Maximum Permissible Current	A	0.35	0.63	1.0	1.4
Dielectric strength (DC voltage 1min)					
Conductor to Conductor	V	1500	2000	3000	3000
Conductor to Screen	V	1500	1500	1500	1500

*Maximum Capacitance for 1 prs and 4 prs are 67 and 62 nF/km respectively.

Mechanical and Thermal Properties

Minimum Bending Radius: 8xOD (static); 16xOD (dynamic)

Temperature Range: -40℃ to +60℃ (during operation); -20℃ to +50℃ (during installation)

Dimensions and Weight

Cable Code	Number of Pairs	Spare pairs	Minimum Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
			Inner	Outer		
0.6mm conductor,0.96mm Insulated Wire (6/10)						
RS/K23-2Y(L)HBH-2P0.6	2	-	1.0	1.0	10.5	130
RS/K23-2Y(L)HBH-4P0.6	4	-	1.0	1.0	14.0	171
RS/K23-2Y(L)HBH-8P0.6	8	-	1.0	1.0	16.5	215
RS/K23-2Y(L)HBH-14P0.6	14	-	1.0	1.2	17.5	290
RS/K23-2Y(L)HBH-20P0.6	20	-	1.0	1.2	18.5	350
RS/K23-2Y(L)HBH-28P0.6	28	-	1.0	1.4	21.0	441
RS/K23-2Y(L)HBH-38P0.6	38	-	1.0	1.4	21.5	533
RS/K23-2Y(L)HBH-56P0.6	56	-	1.0	1.4	23.0	700
RS/K23-2Y(L)HBH-84P0.6	84	-	1.0	1.6	28.0	970
RS/K23-2Y(L)HBH-112P0.6	112	-	1.0	1.6	30.5	1190
RS/K23-2Y(L)HBH-168P0.6	168	2	1.0	1.8	38.0	1847
RS/K23-2Y(L)HBH-224P0.6	224	2	1.0	2.0	44.0	2675
RS/K23-2Y(L)HBH-280P0.6	280	2	1.0	2.0	51.0	3185
RS/K23-2Y(L)HBH-336P0.6	336	4	1.0	2.0	57.0	3680
RS/K23-2Y(L)HBH-392P0.6	392	4	1.0	2.0	58.5	4168
RS/K23-2Y(L)HBH-448P0.6	448	4	1.0	2.2	67.0	4647
RS/K23-2Y(L)HBH-784P0.6	784	4	1.0	2.2	90.5	7406
RS/K23-2Y(L)HBH-896P0.6	896	6	1.0	2.2	102.5	8315
0.8mm conductor, 1.27 mm Insulated Wire (8/10)						
RS/K23-2Y(L)HBH-2P0.8	2	-	1.0	1.0	11.5	155
RS/K23-2Y(L)HBH-4P0.8	4	-	1.0	1.0	15.5	216
RS/K23-2Y(L)HBH-8P0.8	8	-	1.0	1.2	17.5	298
RS/K23-2Y(L)HBH-14P0.8	14	-	1.0	1.4	20.5	412
RS/K23-2Y(L)HBH-20P0.8	20	-	1.0	1.4	23.0	512
RS/K23-2Y(L)HBH-28P0.8	28	-	1.0	1.4	24.5	637
RS/K23-2Y(L)HBH-38P0.8	38	-	1.0	1.6	26.5	805
RS/K23-2Y(L)HBH-56P0.8	56	-	1.0	1.6	32.0	1096
RS/K23-2Y(L)HBH-84P0.8	84	-	1.0	1.8	39.0	1504
RS/K23-2Y(L)HBH-112P0.8	112	-	1.0	1.8	40.5	1880
1.0mm conductor, 1.8mm Insulated Wire (10/10)						
RS/K23-2Y(L)HBH-2P1	2	-	1.0	1.0	12.0	195
RS/K23-2Y(L)HBH-4P1	4	-	1.0	1.2	17.5	298
RS/K23-2Y(L)HBH-8P1	8	-	1.0	1.4	20.5	431
RS/K23-2Y(L)HBH-14P1	14	-	1.0	1.4	23.5	587
RS/K23-2Y(L)HBH-20P1	20	-	1.0	1.6	25.0	762
RS/K23-2Y(L)HBH-28P1	28	-	1.0	1.6	29.0	981
RS/K23-2Y(L)HBH-38P1	38	-	1.0	1.6	31.5	1243
RS/K23-2Y(L)HBH-56P1	56	-	1.0	1.8	38.5	1683
RS/K23-2Y(L)HBH-84P1	84	-	1.0	2.0	46.5	2340
RS/K23-2Y(L)HBH-112P1	112	-	1.0	2.0	51.5	2944
1.2mm conductor, 2.0mm Insulated Wire (12/10)						
RS/K23-2Y(L)HBH-1P1.2	1	-	1.0	1.2	14.0	188
RS/K23-2Y(L)HBH-2P1.2	2	-	1.0	1.2	14.5	230
RS/K23-2Y(L)HBH-4P1.2	4	-	1.0	1.4	20.0	357
RS/K23-2Y(L)HBH-8P1.2	8	-	1.0	1.4	24.0	509
RS/K23-2Y(L)HBH-14P1.2	14	-	1.0	1.4	25.0	710
RS/K23-2Y(L)HBH-20P1.2	20	-	1.0	1.6	29.0	950
RS/K23-2Y(L)HBH-28P1.2	28	-	1.0	1.6	31.5	1213


Impact Resistant

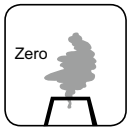

Mineral Oil Resistant


Acid&Alkaline Resistant


Laid In conduit


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

K24 LSZH Subway Signalling Cables

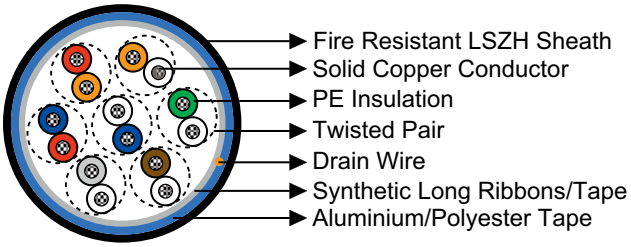
Applications

The cables are designed for remote control and teletransmission in underground railway networks. The cables can be laid in channel, cable tray, or on hook supports, along suburban railway lines electrified at maximum 1500V DC

Standards

- AFNOR NF F 55-624

Construction



- Conductors：Solid copper conductor, 0.5/0.6/0.9 mm nominal diameter
- Insulation：Polyethylene insulation.
- Cabling Element：Each two conductors are twisted together to form a pair.
- Stranding：For cables less than 15 pairs, pairs are helically stranded in concentric layers to form the cable core. For cables from 21 to 112 pairs, pairs are stranded in concentric layers or bundles to form the cables core.
- Core Wrapping：One or more synthetic long ribbons or tapes are arranged on the cable core.
- Screen：Aluminium/Polyester tape.
- Drain Wire: A tinned copper drain wire, 0.5mm nominal diameter.
- Sheath：Fire retardant LSZH.

Optionally

Armoured Cables: For armoured cable, one or more tape(s) is (are) helically applied with overlap on the screen to form a bedding, and double steel tapes armour with a halogen-free fire retardant outer sheath are applied on the bedding.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.5	0.6	0.9
Minimum Insulation Resistance	MΩ.km	5000	5000	5000
Maximum Operating Voltage	V	200	200	400
Maximum Permissible Current	A	0.25	0.35	0.80

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5XOD (unarmoured); 10XOD (armoured)
- Temperature Range: -40℃ to +60℃ (during operation); -20℃ to +50℃ (during installation)

Dimensions and Weight

Unarmoured K24 Cables A-2Y(L)H nx2x0.5/0.6/0.9

Cable Code	Number of Pairs (n)	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
0.5mm conductor, 0.9mm Insulated Wire				
RS/K24-2Y(L)H-2P0.5	2	1.0	6.0	55
RS/K24-2Y(L)H-3P0.5	3	1.0	6.5	65
RS/K24-2Y(L)H-5P0.5	5	1.0	7.0	80
RS/K24-2Y(L)H-7P0.5	7	1.0	8.0	95
RS/K24-2Y(L)H-10P0.5	10	1.0	9.0	120
RS/K24-2Y(L)H-15P0.5	15	1.2	10.5	150
RS/K24-2Y(L)H-21P0.5	21	1.2	12.5	185
0.6mm conductor, 0.96mm Insulated Wire				
RS/K24-2Y(L)H-2P0.6	2	1.0	6.5	65
RS/K24-2Y(L)H-3P0.6	3	1.0	7.0	70
RS/K24-2Y(L)H-5P0.6	5	1.0	8.0	90
RS/K24-2Y(L)H-7P0.6	7	1.0	8.5	110
RS/K24-2Y(L)H-10P0.6	10	1.2	10.0	140
RS/K24-2Y(L)H-15P0.6	15	1.2	11.5	175
RS/K24-2Y(L)H-21P0.6	21	1.2	13.5	225
0.9mm Conductor，1.5mm Insulated Wire				
RS/K24-2Y(L)H-2P0.9	2	1.0	8.5	95
RS/K24-2Y(L)H-3P0.9	3	1.0	9.0	110
RS/K24-2Y(L)H-5P0.9	5	1.0	10.5	150
RS/K24-2Y(L)H-7P0.9	7	1.2	12.0	185
RS/K24-2Y(L)H-10P0.9	10	1.2	13.5	245
RS/K24-2Y(L)H-15P0.9	15	1.4	15.0	340
RS/K24-2Y(L)H-21P0.9	21	1.4	19.0	435

Armoured K24 Cables A-2Y(L)HBH nx2x0.5/0.6/0.9

Cable Code	Number of Pairs (n)	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.5mm conductor, 0.9mm Insulated Wire					
RS/K24-2Y(L)HBH-2P0.5	2	1.0	1.0	10.0	195
RS/K24-2Y(L)HBH-3P0.5	3	1.0	1.0	10.5	205
RS/K24-2Y(L)HBH-5P0.5	5	1.0	1.0	11.0	230
RS/K24-2Y(L)HBH-7P0.5	7	1.0	1.0	12.0	255
RS/K24-2Y(L)HBH-10P0.5	10	1.0	1.0	13.0	295
RS/K24-2Y(L)HBH-15P0.5	15	1.0	1.2	14.5	345
RS/K24-2Y(L)HBH-21P0.5	21	1.0	1.2	16.5	400
0.6mm conductor, 0.96mm Insulated Wire					
RS/K24-2Y(L)HBH-2P0.6	2	1.0	1.0	10.5	200
RS/K24-2Y(L)HBH-3P0.6	3	1.0	1.0	11.0	210
RS/K24-2Y(L)HBH-5P0.6	5	1.0	1.0	12.0	245
RS/K24-2Y(L)HBH-7P0.6	7	1.0	1.0	12.5	285
RS/K24-2Y(L)HBH-10P0.6	10	1.0	1.2	14.0	330
RS/K24-2Y(L)HBH-15P0.6	15	1.0	1.2	15.5	385
RS/K24-2Y(L)HBH-21P0.6	21	1.0	1.2	18.0	450
0.9mm Conductor，1.5mm Insulated Wire					
RS/K24-2Y(L)HBH-2P0.9	2	1.0	1.0	12.5	260
RS/K24-2Y(L)HBH-3P0.9	3	1.0	1.0	13.5	285
RS/K24-2Y(L)HBH-5P0.9	5	1.0	1.0	14.5	345
RS/K24-2Y(L)HBH-7P0.9	7	1.0	1.2	16.0	395
RS/K24-2Y(L)HBH-10P0.9	10	1.0	1.2	18.0	485
RS/K24-2Y(L)HBH-15P0.9	15	1.0	1.4	19.5	610
RS/K24-2Y(L)HBH-21P0.9	21	1.0	1.4	24.0	735


Impact Resistant


Mineral Oil Resistant


Acid&Alkaline Resistant


Laid In conduit


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

K13 PVC Subway Signalling Cables for Metro/Local Trains/Tramlines

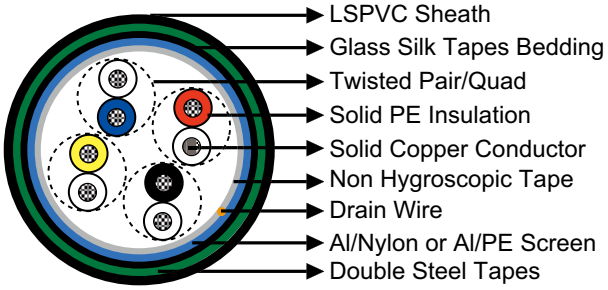
Applications

The cables are designed for remote control and teletransmission in underground railway networks. The cables can be laid in channel, cable tray, or on hook supports, along suburban railway lines electrified at maximum 1500V DC

Standards

- AFNOR NF F 55-633

Construction



- Conductors：Solid copper conductor, 0.6/0.8/1.0/1.2 mm nominal diameter
- Insulation：Polyethylene insulation.
- Cabling Element：Pair/Quad.
- Stranding：4-pair cables are composed of pairs, while other cables are composed of star quads.
- Spare Pairs: Spare pairs may be provided according to capacity of cables.
- Core Wrapping: One or more non-hygroscopic polyester tapes are helically or longitudinally laid with an overlap.
- Screen: Aluminium/Nylon tape bonded with a special PVC sealing sheath or Aluminium/PE tape bonded with a halogen-free fire-retardant sheath.
- Drain Wire: A tinned copper drain wire, 0.5mm nominal diameter.
- Bedding: Several glass silk tapes are helically laid with an overlap to form bedding.
- Armour: Two helically applied steel tapes.
- Outer Sheath: LSPVC.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.6	0.8	1.0	1.2
Nominal Mutual Capacity	nF/km	57.5	57.5	57.5	57.5
Minimum Insulation Resistance	MΩ.km	5000	5000	5000	5000
Maximum Operating Voltage	V	200	400	500	750
Maximum Permissible Current	A	0.35	0.63	1.0	1.4

Mechanical and Thermal Properties

- Minimum Bending Radius: 8xOD (static); 16xOD (dynamic)
- Temperature Range: -40℃ to +60℃ (during operation); -20℃ to +50℃ (during installation)

Core Identification

4-pair cable:

Pair1: black/colourless	Pair2: blue/ colourless
Pair3: yellow/colourless	Pair4: red/ colourless

Other cable:

Side circuit 1 of a quad	a-wire: sequence of black/blue/yellow/red/green/blue/yellow, etc.
	b-wire: colourless
Side circuit 2 of a quad	a-wire: grey
	b-wire: white

Unit binder: sequence of white/blue/yellow/brown/black/red/green/violet

Dimensions and Weight

Cable Code	Number of Pairs	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.6mm conductor, 0.96mm Insulated Wire					
RS/K13-2Y(L)2YBY-4P0.6	4	1.0	1.0	12.5	220
RS/K13-2Y(L)2YBY-8P0.6	8(4Q)	1.0	1.0	13.5	260
RS/K13-2Y(L)2YBY-14P0.6	14(7Q)	1.0	1.2	15.5	350
RS/K13-2Y(L)2YBY-28P0.6	28(14Q)	1.0	1.4	17.5	480
RS/K13-2Y(L)2YBY-56P0.6	56(4 x 7Q)	1.0	1.4	22.0	750
0.8mm conductor, 1.27mm Insulated Wire					
RS/K13-2Y(L)2YBY-4P0.8	4	1.0	1.0	14.0	280
RS/K13-2Y(L)2YBY-8P0.8	8(4Q)	1.0	1.2	15.0	340
RS/K13-2Y(L)2YBY-14P0.8	14(7Q)	1.0	1.4	18.0	470
RS/K13-2Y(L)2YBY-28P0.8	28(14Q)	1.0	1.4	21.0	700
RS/K13-2Y(L)2YBY-56P0.8	56(4 x 7Q)	1.0	1.6	28.5	1200
1.0mm Conductor, 1.8mm Insulated Wire					
RS/K13-2Y(L)2YBY-4P1	4	1.0	1.2	15.5	340
RS/K13-2Y(L)2YBY-8P1	8(4Q)	1.0	1.4	17.5	460
RS/K13-2Y(L)2YBY-14P1	14(7Q)	1.0	1.4	20.5	630
RS/K13-2Y(L)2YBY-28P1	28(14Q)	1.0	1.6	25.0	990
RS/K13-2Y(L)2YBY-56P1	56(4 x 7Q)	1.0	1.8	34.0	1700
1.2mm Conductor, 2.0mm Insulated Wire					
RS/K13-2Y(L)2YBY-2P1.2	2(1Q)	1.0	1.2	12.5	240
RS/K13-2Y(L)2YBY-4P1.2	4	1.0	1.4	17.0	420
RS/K13-2Y(L)2YBY-8P1.2	8(4Q)	1.0	1.4	18.5	530
RS/K13-2Y(L)2YBY-14P1.2	14(7Q)	1.0	1.4	21.5	740
RS/K13-2Y(L)2YBY-28P1.2	28(14Q)	1.0	1.6	27.5	1250


Impact Resistant


Mineral Oil Resistant


Acid&Alkaline Resistant


Laid In conduit


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

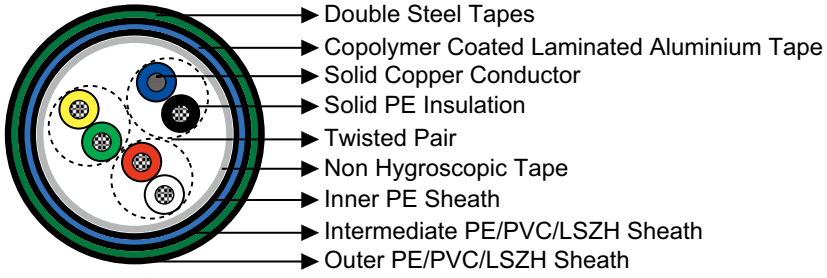
Digicode 30KHz Indoor Signalling Cables

Applications

The cables are designed for transmission of track circuit digicode signals up to 30 kHz in electrified lines.

Standards

- EN 50266-2-4 & IEC 60332-3(Fire performance)
- EN 50268-2(Smoke density)
- EN 50267-2-1(Halogen content)
- EN 50267-2-2(Gases acidity)
- EN 50265-2-1, IEC 60332-1, NF C 32070 Cat C2 compliant (for PVC sheathed cables)



Construction

- Conductors: Solid Annealed copper, 1.4 mm nominal diameter (0.6 mm for the auxiliary pair).
- Insulation: Polyethylene.
- Cabling Element: Two insulated conductors are twisted together to form a pair.
- Stranding: Pairs are helically stranded to get the cable core.
- Core wrapping: Plastic tape(s) with overlapping
- Inner sheath: Low density polyethylene.
- Moisture barrier: Copolymer coated laminated aluminium tape.
- Intermediate sheath: LSZH fire retardant compound. PE or PVC option can be offered upon request.
- Mechanical protection: Two helically applied steel tapes.
- Outer sheath: LSZH fire retardant compound. PE or PVC option can be offered upon request.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	1.4
Maximum DC Conductor Resistance	Ω/km	12.1
Maximum Resistance Unbalance	%	3
Minimum Insulation Resistance @500 V DC (1min)	MΩ.km	5000
Dielectric strength (DC voltage 1 min)		
Conductor to Conductor	V	1000
Conductor to Screen	V	3000
Minimum Spark Test On Outer Sheath (AC voltage)	V	5000
Maximum Mutual capacitance (Data pairs)	nF/km	45
Nominal Mutual capacitance (Auxiliary pair)	nF/km	50
Maximum Capacitance Unbalance		

Pair to Pair	nF/500m	400
Pair to Ground	nF/500m	1500
Maximum Characteristic Pair Attenuation		
@2.1KHz	dB/km	0.64
@4.1KHz	dB/km	0.76
@9.5KHz	dB/km	1.05
@20.7KHz	dB/km	1.28
Minimum Near End Crosstalk Attenuation (NEXT)		
@4.1KHz	dB/km	54
@20.7KHz	dB/km	42
Minimum Far End Crosstalk Attenuation (FEXT)		
@4.1KHz	dB/km	59
@20.7KHz	dB/km	48
Minimum Unbalance Attenuation	dB	40
Maximum Rated Voltage, between pair conductors	V rms	220
Maximum Rated Current	A rms	1

Mechanical and Thermal Properties

- Minimum Bending Radius: 8xOD (static); 16xOD (dynamic)
- Temperature Range: -40℃ to +60℃ (during operation); -20℃ to +50℃ (during installation)

Dimensions and Weight

Cable Code	Number of Pairs	Nominal Sheath Thickness mm			Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Interm.	Outer		
RS/DIG-2Y2Y(L)HBH-1P1.4	1*	0.7	1.3	1.5	17.9	428
RS/DIG-2Y2Y(L)HBH-2P1.4	2*	0.7	1.3	1.5	19.2	497
RS/DIG-2Y2Y(L)HBH-3P1.4	3	0.7	1.3	1.5	20.2	562

*Plus one auxiliary pair with 0.6mm conductors.

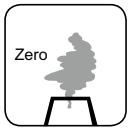

Mineral Oil Resistant


Acid&Alkaline Resistant


Laid In conduit


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

Inductive Loop Cable

Application

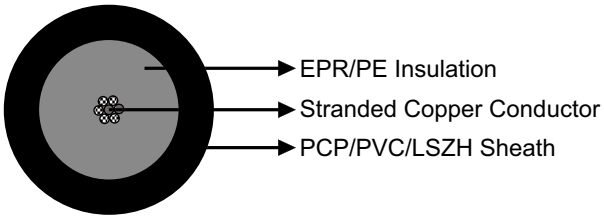
The cables are designed for installation between railway running rails and they provide communications between trains and trackside equipments.

Standards

- TR2029

Construction

- Conductors: Stranded copper conductor.
- Insulation: EPR/PE.
- Sheath: PCP/PVC/LSZH.

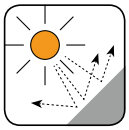


Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5	2.5
Maximum Conductor Resistance	Ω/km	13.7	7.41
Minimum Insulation Resistance	MΩ.km	5000	5000
Capacitance to Earth @1KHz	pF/km	0.1	0.1

Mechanical and Thermal Properties

- Minimum Bending Radius: 6 x OD (static); 15 x OD (dynamic)
- Temperature Range: -20℃ to +85℃


UV Resistant


Mineral Oil Resistant

Rated voltage


Buried in Ground


Laid In Ducts

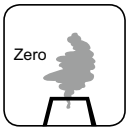
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RS/2029-3G5G -1C1.5S	1 x 1.5	30/0.25	0.8	1.4	6.6	70
RS/2029-2YY -1C2.5S	1 x 2.5	7/0.67	3.5	2.0	13	183
RS/2029-2YH -1C2.5S	1 x 2.5	7/0.67	0.7	4.5	13	219

LSZH Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

EAPSP nx4x0.9/1.3/1.4

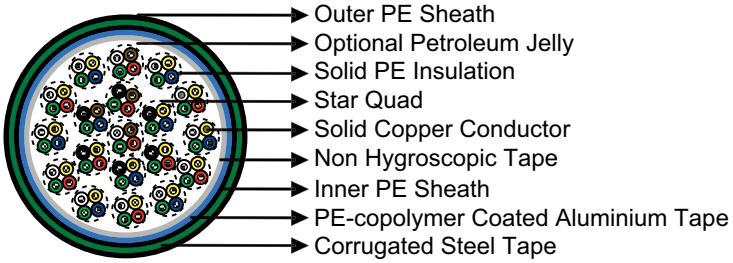
Applications

The cables are used as railway cables and can be installed directly into the ground or in ducts.

Standards

- RENFE E.T. 03.365.051.6

Construction



- Conductors: Soft annealed solid copper, 0.9/1.3/1.4 mm nominal diameter.
- Insulation: PE Insulation.
- Cabling Element: Four insulated conductors are twisted together to form a quad.
- Stranding: Star quads are helically stranded in concentric layers.
- Core Wrapping: Plastic tape(s) with overlapping.
- Moisture Barrier: One laminated sheath made of aluminium tape (0.2mm thick) coated with copolymer on at least one side is applied with longitudinally overlap.
- Inner Sheath: PE sheath.
- Armour: One corrugated steel tape is longitudinally applied with overlap.
- Outer Sheath: PE sheath.

Optionally

Jelly Filled Cables: The cable core interstices are filled with petroleum jelly to avoid longitudinal water penetration within the cable. The water resistant filling compound is applied to the air space between non-hygroscopic tape and shield, shield and sheath within the cable core.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.9	1.3	1.4
Maximum Conductor Resistance	Ω/km	28.5	13.7	11.7
Minimum Insulation Resistance @500 V DC	MΩ.km	25000	25000	25000
Resistance Unbalance	%	1	1	1
Mutual Capacitance @800Hz	nF/km	41	45	45
Capacitance Unbalance @800Hz				
K_1 mean value/individual value	pF/460m	35/250	35/250	35/250
$K_{9\text{-}12}$ mean value/individual value	pF/460m	35/250	35/250	35/250
$ea_{1/2}$ mean value/individual value	pF/460m	320/1200	320/1200	320/1200

Attenuation @1KHz	dB/km	0.7	0.5	0.46
Test Voltage @50Hz 1min				
Core to core	V_{eff}	2100	2100	2100
Core to screen	V_{eff}	2500	2500	2500
Core to armouring	V_{eff}	2000	2000	2000

Mechanical and Thermal Properties

Minimum Bending Radius: 10xOD

Temperature Range: -30℃ to +70℃ (during operation); -10℃ to +50℃ (during installation)

Dimensions and Weight

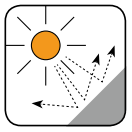
EAPSP n x 4 x 0.9/1.3/1.4 Cables

Cable Code	Number of Quads (n)	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.9mm conductor, 1.8mm Insulated Wire					
RS/EAPSP-2Y(L)2YB2Y-1Q0.9	1	1.3	1.4	15.5	240
RS/EAPSP-2Y(L)2YB2Y-3Q0.9	3	1.3	1.4	19.5	380
RS/EAPSP-2Y(L)2YB2Y-5Q0.9	5	1.3	1.4	22.0	490
RS/EAPSP-2Y(L)2YB2Y-7Q0.9	7	1.3	1.4	24.0	580
RS/EAPSP-2Y(L)2YB2Y-10Q0.9	10	1.3	1.4	27.5	750
RS/EAPSP-2Y(L)2YB2Y-14Q0.9	14	1.4	1.6	30.0	920
1.3mm conductor，2.5mm Insulated Wire					
RS/EAPSP-2Y(L)2YB2Y-1Q1.3	1	1.3	1.4	16.0	270
RS/EAPSP-2Y(L)2YB2Y-3Q1.3	3	1.3	1.4	20.5	470
RS/EAPSP-2Y(L)2YB2Y-5Q1.3	5	1.4	1.6	26.5	680
RS/EAPSP-2Y(L)2YB2Y-7Q1.3	7	1.4	1.6	27.0	840
RS/EAPSP-2Y(L)2YB2Y-10Q1.3	10	1.4	1.6	30.5	1100
RS/EAPSP-2Y(L)2YB2Y-14Q1.3	14	1.5	1.6	34.0	1400
1.4mm conductor, 2.6mm Insulated Wire					
RS/EAPSP-2Y(L)2YB2Y-1Q1.4	1	1.3	1.4	18.0	330
RS/EAPSP-2Y(L)2YB2Y-3Q1.4	3	1.3	1.4	23.0	560
RS/EAPSP-2Y(L)2YB2Y-5Q1.4	5	1.4	1.6	26.5	770
RS/EAPSP-2Y(L)2YB2Y-7Q17	7	1.4	1.6	29.0	950
RS/EAPSP-2Y(L)2YB2Y-10Q1.4	10	1.4	1.6	34.0	1280
RS/EAPSP-2Y(L)2YB2Y-14Q1.4	14	1.5	1.6	38.0	1650
RS/EAPSP-2Y(L)2YB2Y-19Q1.4	19	1.6	1.8	43.0	2120

EAPSP-R n x 4 x 0.9/1.3 Cables

Cable Code	Number of Quads (n)	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.9mm conductor, 1.8mm Insulated Wire					
RS/EAPSP-R-2Y(F)(L)2YB2Y-1Q0.9	1	1.3	1.4	16.5	270
RS/EAPSP-R-2Y(F)(L)2YB2Y-3Q0.9	3	1.3	1.4	22.0	470
RS/EAPSP-R-2Y(F)(L)2YB2Y-5Q0.9	5	1.3	1.4	25.0	630
RS/EAPSP-R-2Y(F)(L)2YB2Y-7Q0.9	7	1.3	1.4	26.7	730
RS/EAPSP-R-2Y(F)(L)2YB2Y-10Q0.9	10	1.3	1.4	31.5	980
RS/EAPSP-R-2Y(F)(L)2YB2Y-12Q0.9	12	1.4	1.6	32.8	1090
RS/EAPSP-R-2Y(F)(L)2YB2Y-14Q0.9	14	1.4	1.6	34.6	1230
RS/EAPSP-R-2Y(F)(L)2YB2Y-19Q0.9	19	1.5	1.6	39.0	1560
RS/EAPSP-R-2Y(F)(L)2YB2Y-25Q0.9	25	1.5	1.6	43.2	1940

Cable Code	Number of Quads (n)	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
1.3mm conductor，2.5mm Insulated Wire					
RS/EAPSP-R-2Y(F)(L)2YB2Y-1Q1.3	1	1.3	1.4	18.0	360
RS/EAPSP-R-2Y(F)(L)2YB2Y-3Q1.3	3	1.3	1.4	23.0	570
RS/EAPSP-R-2Y(F)(L)2YB2Y-5Q1.3	5	1.4	1.6	29.5	830
RS/EAPSP-R-2Y(F)(L)2YB2Y-7Q1.3	7	1.4	1.6	29.7	980
RS/EAPSP-R-2Y(F)(L)2YB2Y-10Q1.3	10	1.4	1.6	34.5	1330
RS/EAPSP-R-2Y(F)(L)2YB2Y-12Q1.3	12	1.5	1.8	38.0	1580
RS/EAPSP-R-2Y(F)(L)2YB2Y-14Q1.3	14	1.5	1.8	38.6	1710
RS/EAPSP-R-2Y(F)(L)2YB2Y-19Q1.3	19	1.6	2.0	45.5	2260
RS/EAPSP-R-2Y(F)(L)2YB2Y-25Q1.3	25	1.6	2.0	50.5	2840


UV Resistant


Water Resistant

Rated Voltage


Buried in Ground


Laid In Ducts

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

CCPSSP-FR0.3 nx2x0.9/1.4

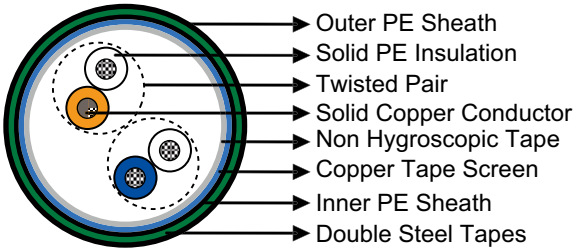
Applications

The cables are used as railway cables and can be installed directly into the ground or in ducts.

Standards

- RENFE E.T. 03.365.051.6

Construction



- Conductors: Soft annealed solid copper, 1.4 mm nominal diameter.
- Insulation: PE Insulation.
- Cabling Element: Two insulated conductors are twisted together to form a pair.
- Stranding: Pairs are helically stranded in concentric layers.
- Core Wrapping: Two or more layers of plastic tape(s) with overlapping.
- Screen: Copper tapes with overlap (protection against interference).
- Inner Sheath: PE sheath.
- Armour: Two layers steel tape (0.8mm thick).
- Outer Sheath: PE sheath.

Electrical Characteristics at 20□

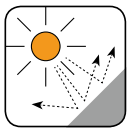
Nominal Conductor Diameter	mm	0.9	1.4
Maximum Conductor Resistance	Ω/km	28.5	11.7
Minimum Insulation Resistance @500 V DC	MΩ.km	15000	15000
Mutual Capacitance @1KHz	nF/km	58	58
Capacitance Unbalance @1KHz			
Pair to pair	pF/km	260	260
Pair to earth	pF/km	2625	2625
Test Voltage @50Hz 1min			
Core to core	V_{eff}	2100	2100
Core to screen	V_{eff}	2500	2500
Reduction Factor (f=50Hz)		0.3	0.3

Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ to +60℃ (during installation)

Dimensions and Weight

Cable Code	Number of Pairs	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.9mm conductor, 1.8mm Insulated Wire					
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-6P0.9	6	1.5	1.6	19.2	720
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-10P0.9	10	1.5	1.6	24.0	1011
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-12P0.9	12	1.5	1.6	24.5	1067
1.4mm Conductor,2.7mm Insulated Wire					
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-2P1.4	2	1.5	1.6	22.5	904
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-6P1.4	6	1.6	1.8	25.5	1155
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-7P1.4	7	1.6	1.8	26.9	1258
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-10P1.4	10	1.7	1.8	30.9	1542
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-11P1.4	11	1.7	1.8	30.9	1576
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-14P1.4	14	1.7	1.8	37.1	1827
RS/CCPSSP-FR0.3-2Y(K)2YB2Y-20P1.4	20	1.8	2.0	37.9	2214


UV Resistant


Water Resistant

Rated Voltage


Buried in Ground


Laid In Ducts

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Anti Induction

CCPSSP-FR0.1 nx4x0.9/1.4

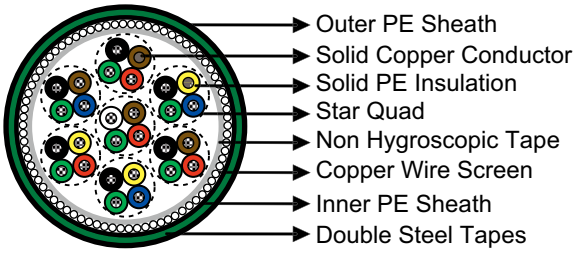
Applications

The cables are used as railway cables and can be installed directly into the ground or in ducts.

Standards

- RENFE E.T. 03.365.051.6

Construction



- Conductors: Soft annealed solid copper, 0.9/1.4 mm nominal diameter.
- Insulation: PE Insulation.
- Cabling Element: Four insulated conductors are twisted together to form a quad.
- Stranding: Quads are helically stranded in concentric layers.
- Core Wrapping: Two or more layers of plastic tape(s) with overlapping.
- Screen: 0.9/1.2/1.4/1.8mm copper wires wrapping with one plastic tape (protection against interference).
- Inner Sheath: PE sheath.
- Armour: Two layers of steel tape (0.8mm thick).
- Outer Sheath: PE sheath.

Electrical Characteristics at 20□

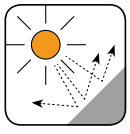
Nominal Conductor Diameter	mm	0.9	1.4
Maximum Conductor Resistance	Ω/km	28.5	11.7
Minimum Insulation Resistance @500 V DC	MΩ.km	35000	35000
Mutual Capacitance @800Hz	nF/km	41	45
Capacitance Unbalance @800Hz			
K_1 maximum individual value	pF/460m	250	250
$K_{9\text{-}12}$ maximum individual value	pF/460m	250	250
$ea_{1/2}$ maximum individual value	pF/460m	1200	1200
Attenuation			
@1KHz	dB/km	0.7	0.46
@10KHz	dB/km	1.6	0.85
@30KHz	dB/km	2.1	1.3
Test Voltage @50Hz 1min			
Core to core	V_{eff}	2100	2100
Core to screen	V_{eff}	2500	2500
Core to armouring	V_{eff}	2000	2000

Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ to +60℃ (during installation)

Dimensions and Weight

Cable Code	Number of Quads	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.9mm conductor, 1.8mm Insulated Wire					
RS/CCPSSP-FR0.1-2YD2YB2Y-1Q0.9	1	1.5	1.6	21.2	1140
RS/CCPSSP-FR0.1-2YD2YB2Y-3Q0.9	3	1.5	1.6	24.5	1370
RS/CCPSSP-FR0.1-2YD2YB2Y-5Q0.9	5	1.5	1.6	27.0	1610
RS/CCPSSP-FR0.1-2YD2YB2Y-7Q0.9	7	1.5	1.6	28.4	1750
RS/CCPSSP-FR0.1-2YD2YB2Y-10Q0.9	10	1.5	1.6	32.1	2060
RS/CCPSSP-FR0.1-2YD2YB2Y-12Q0.9	12	1.5	1.6	32.1	2130
RS/CCPSSP-FR0.1-2YD2YB2Y-14Q0.9	14	1.6	1.8	35.3	2380
RS/CCPSSP-FR0.1-2YD2YB2Y-19Q0.9	19	1.7	1.8	38.6	2760
RS/CCPSSP-FR0.1-2YD2YB2Y-25Q0.9	25	1.7	1.8	42.0	3150
1.4mm Conductor, 2.7mm Insulated Wire					
RS/CCPSSP-FR0.1-2YD2YB2Y-1Q1.4	1	1.5	1.6	22.7	1280
RS/CCPSSP-FR0.1-2YD2YB2Y-3Q1.4	3	1.5	1.6	28.0	1690
RS/CCPSSP-FR0.1-2YD2YB2Y-5Q1.4	5	1.6	1.8	32.0	2070
RS/CCPSSP-FR0.1-2YD2YB2Y-7Q1.4	7	1.6	1.8	33.9	2320
RS/CCPSSP-FR0.1-2YD2YB2Y-10Q1.4	10	1.6	1.8	39.2	2860
RS/CCPSSP-FR0.1-2YD2YB2Y-12Q1.4	12	1.7	1.8	39.2	2980
RS/CCPSSP-FR0.1-2YD2YB2Y-14Q1.4	14	1.7	1.8	42.6	3340
RS/CCPSSP-FR0.1-2YD2YB2Y-19Q1.4	19	1.8	2.0	48.5	4160

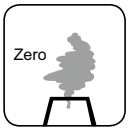

UV Resistant


Water Resistant

Rated Voltage


Buried in Ground


Laid In Ducts



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Anti Induction

CCPSSP-R-FR0.1

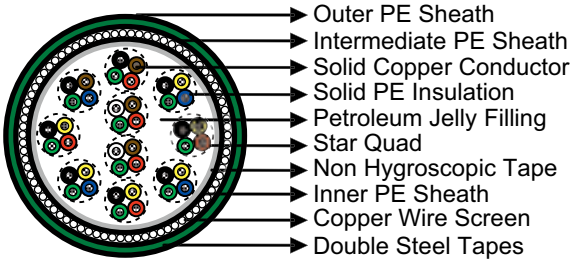
Applications

The cables are used as railway cables and can be installed directly into the ground or in ducts.

Standards

- RENFE E.T. 03.365.051.6

Construction



- Conductors: Soft annealed solid copper, 0.9 mm nominal diameter.
- Insulation: PE Insulation.
- Cabling Element: Four insulated conductors are twisted together to form a quad.
- Stranding: Quads are helically stranded in concentric layers.
- Filling：Petroleum jelly filling.
- Core Wrapping: At least one layer of water swellable material with overlapping.
- Inner Sheath: PE sheath.
- Screen: 1.4/1.8mm copper wires wrapping with one plastic tape (protection against interference).
- Intermediate Sheath: PE sheath.
- Armour: Two layers of steel tape (0.8mm thick).
- Outer Sheath: PE sheath.

Electrical Characteristics at 20□

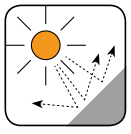
Nominal Conductor Diameter	mm	0.9
Maximum Conductor Resistance	Ω/km	28.5
Minimum Insulation Resistance @500 V DC	MΩ.km	25000
Mutual Capacitance @800Hz	nF/km	41
Capacitance Unbalance @800Hz		
K1 maximum individual value	pF/460m	250
K9-12 maximum individual value	pF/460m	250
ea1/2 maximum individual value	pF/460m	1200
Attenuation		
@1KHz	dB/km	0.7
@10KHz	dB/km	1.6
@30KHz	dB/km	2.1
Test Voltage @50Hz 1min		
Core to core	V_{eff}	2100
Core to screen	V_{eff}	2500
Core to armouring	V_{eff}	2000

Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -30℃ to +70℃ (during operation); -5℃ to +50℃ (during installation)

Dimensions and Weight

Cable Code	Number of Quads	Nominal Sheath Thickness mm			Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Inter.	Outer		
0.9mm conductor, 1.8mm Insulated Wire						
RS/CCPSSP-R-FR0.1-2Y(F)2YD2YB2Y-1Q0.9	1	1.5	1.5	1.6	23.7	1300
RS/CCPSSP-R-FR0.1-2Y(F)2YD2YB2Y-3Q0.9	3	1.5	1.5	1.6	27.7	1648
RS/CCPSSP-R-FR0.1-2Y(F)2YD2YB2Y-5Q0.9	5	1.5	1.5	1.6	31.5	1984
RS/CCPSSP-R-FR0.1-2Y(F)2YD2YB2Y-25Q0.9	25	1.7	1.7	1.8	51.3	4166

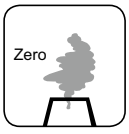

UV Resistant


Water Resistant

Rated Voltage


Buried in Ground


Laid In Ducts



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Anti Induction

CCTSST-FR0.1 nx4x0.9/1.4

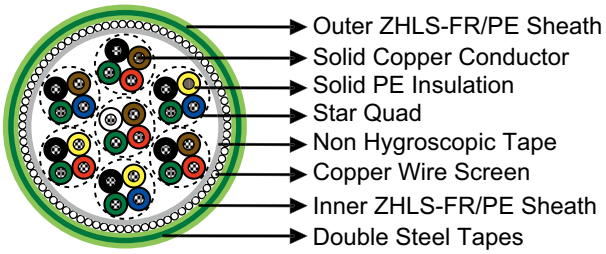
Applications

The cables are used as railway cables and can be installed directly into the ground or in ducts.

Standards

- RENFE E.T. 03.365.051.6

Construction



- Conductors: Soft annealed solid copper, 0.9/1.4 mm nominal diameter.
- Insulation: PE Insulation.
- Cabling Element: Four insulated conductors are twisted together to form a quad.
- Stranding: Quads are helically stranded in concentric layers.
- Core Wrapping: Two or more layers of plastic tape(s) with overlapping.
- Screen: 0.9/1.2/1.4/1.8mm copper wires wrapping with one plastic tape (protection against interference).
- Inner Sheath: LSZH-FR-PE sheath, coloured green. PE sheath can be offered as an option.
- Armour: Two layers of steel tape (0.8mm thick).
- Outer Sheath: LSZH-FR-PE sheath, coloured green. (LSZH-FR= Low smoke, zero halogen, fire retardant). PE sheath can be offered as an option.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.9	1.4
Maximum Conductor Resistance	Ω/km	28.5	11.7
Minimum Insulation Resistance @500 V DC	MΩ.km	35000	35000
Mutual Capacitance @800Hz	nF/km	41	45
Capacitance Unbalance @800Hz			
K_1 maximum individual value	pF/460m	250	250
$K_{9\text{-}12}$ maximum individual value	pF/460m	250	250
$ea_{1/2}$ maximum individual value	pF/460m	1200	1200
Attenuation			
@1KHz	dB/km	0.7	0.46
@10KHz	dB/km	1.6	0.85
@30KHz	dB/km	2.1	1.3
Test Voltage @50Hz 1min			
Core to core	V_{eff}	2100	2100
Core to screen	V_{eff}	2500	2500
Core to armouring	V_{eff}	2000	2000

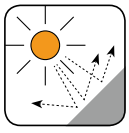
Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ to +60℃ (during installation)

Dimensions and Weight

Cable Code	Number of Quads	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.9mm conductor, 1.8mm Insulated Wire					
RS/CCTSST-FR0.1-2YDHBH-1Q0.9	1	1.5	1.6	20.6	1170
RS/CCTSST-FR0.1-2YDHBH-3Q0.9	3	1.5	1.6	24.7	1480
RS/CCTSST-FR0.1-2YDHBH-5Q0.9	5	1.5	1.6	27.3	1740
RS/CCTSST-FR0.1-2YDHBH-7Q0.9	7	1.5	1.6	29.6	1950
RS/CCTSST-FR0.1-2YDHBH-10Q0.9	10	1.5	1.6	33.5	2320
RS/CCTSST-FR0.1-2YDHBH-25Q0.9	25	1.7	1.8	44.2	3590
1.4mm Conductor, 2.7mm Insulated Wire					
RS/CCTSST-FR0.1-2YDHBH-10Q1.4	10	1.6	1.8	39.2	3140

Anti Induction


UV Resistant


Water Resistant

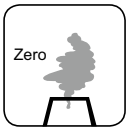
Rated Voltage


Buried in Ground


Laid In Ducts


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

CCTSST-FR0.3 nx4x1.4

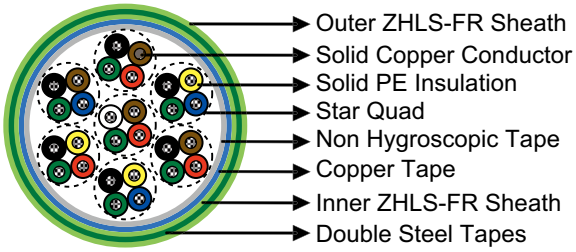
Applications

The cables are used as railway cables and can be installed directly into the ground or in ducts.

Standards

- RENFE E.T. 03.365.051.6

Construction



- Conductors: Soft annealed solid copper, 1.4 mm nominal diameter.
- Insulation: PE Insulation.
- Cabling Element: Four insulated conductors are twisted together to form a quad.
- Stranding: Quads are helically stranded in concentric layers.
- Core Wrapping: Two or more layers of plastic tape(s) with overlapping.
- Screen: Copper tapes with overlap (protection against interference).
- Inner Sheath: LSZH-FR-PE sheath, coloured green.
- Armour: Two layers steel tape (0.8mm thick).
- Outer Sheath: LSZH-FR-PE sheath, coloured green. (LSZH-FR= Low smoke, zero halogen, fire retardant)

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	1.4
Maximum Conductor Resistance	Ω/km	11.7
Minimum Insulation Resistance @500 V DC	MΩ.km	35000
Mutual Capacitance @800Hz	nF/km	45
Capacitance Unbalance @800Hz		
K_1 maximum individual value	pF/460m	250
$K_{9\text{-}12}$ maximum individual value	pF/460m	250
$ea_{1/2}$ maximum individual value	pF/460m	1200
Test Voltage @50Hz 1min		
Core to core	V_{eff}	2100
Core to screen	V_{eff}	2500
Reduction Factor @50Hz		0.3

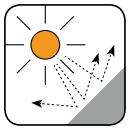
Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ to +60℃ (during installation)

Dimensions and Weight

Cable Code	Number of Quads	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
1.4mm Conductor, 2.6mm Insulated Wire					
RS/CCTSST-FR0.3-2Y(K)HBH-1Q1.4	1	1.5	1.6	19.0	880
RS/CCTSST-FR0.3-2Y(K)HBH-3Q1.4	3	1.5	1.6	27.1	1440
RS/CCTSST-FR0.3-2Y(K)HBH-5Q1.4	5	1.5	1.6	31.0	1826
RS/CCTSST-FR0.3-2Y(K)HBH-7Q1.4	7	1.5	1.6	33.1	2090
RS/CCTSST-FR0.3-2Y(K)HBH-10Q1.4	10	1.7	1.8	38.4	2640
RS/CCTSST-FR0.3-2Y(K)HBH-14Q1.4	14	1.7	1.8	42.2	3168
RS/CCTSST-FR0.3-2Y(K)HBH-19Q1.4	19	1.8	2.0	47.2	3861

Anti Induction


UV Resistant


Water Resistant

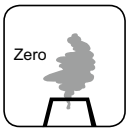
Rated Voltage


Buried in Ground


Laid In Ducts


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

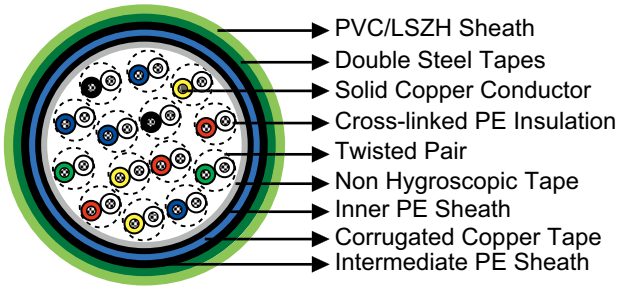
SXCAV & SXCAG Signalling Cables

Applications

The cables are designed for connection between switching centers and equipment shelters along the trackside. The cables are used as main signalling cables specially designed to give good induction protection (R.F=0.24 at inductive voltage 170 V/km) and are suitable for installation in intercity railways electrified at 25KV ac.

Standards

- SXCAV SXCAG Specification
- Fire performance: EN 50266-2-4 C



Construction

- Conductors: Class 1 solid bare copper conductor.
- Insulation: Coloured cross-linked PE Insulation.
- Cabling Element：Each two conductors are twisted together to form a pair.
- Stranding：Pairs are helically stranded in layers to form the cable core.
- Core Wrapping：Plastic tape(s) with overlapping.
- Inner Sheath：PE sheath.
- Electrostatic Shield：One corrugated copper tape.
- Intermediate Sheath：PE sheath.
- Electromagnetic Shield：Two helically applied steel tapes.
- Outer Sheath：Black unleaded PVC (SXCAV) or green halogen free (SXCAG) sheath.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	1.38
Nominal Cross Section Area	mm sq	1.5
Maximum Conductor Resistance (DC)	Ω/km	12.3
Minimum Insulation Resistance @500 V DC (3mins)	MΩ.km	10000
Maximum Mutual Capacitance @1000Hz (AC)	nF/km	60
Maximum Reduction Factor @170V/km		0.24
Operating Voltage	V	1000

Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -25℃ to +90℃ (during operation); -10℃ to +90℃ (during installation)

Dimensions and Weight

SXCAV Cables

Cable Code	Number of Pairs	Nominal Sheath Thickness mm			Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Inter.	Outer		
1.38mm conductor, 2.38mm Insulated Wire						
RS/SXCAV-2Y2Y(K)2YBY-1P1.5S	1	1.0	0.8	1.6	16.9	513
RS/SXCAV-2Y2Y(K)2YBY-4P1.5S	4	1.0	0.8	1.6	23.1	826
RS/SXCAV-2Y2Y(K)2YBY-7P1.5S	7	1.0	0.8	1.7	26.1	1060
RS/SXCAV-2Y2Y(K)2YBY-14P1.5S	14	1.2	0.8	1.8	32.3	1571
RS/SXCAV-2Y2Y(K)2YBY-24P1.5S	24	1.2	1.1	2.0	38.3	2199
RS/SXCAV-2Y2Y(K)2YBY-30P1.5S	30	1.2	1.1	2.2	42.8	2555

SXCAG Cables

Cable Code	Number of Pairs	Nominal Sheath Thickness mm			Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Inter.	Outer		
1.38mm conductor, 2.38mm Insulated Wire						
RS/SXCAG-2Y2Y(K)2YBH-1P1.5S	1	1.0	0.8	1.6	16.9	515
RS/SXCAG-2Y2Y(K)2YBH-4P1.5S	4	1.0	0.8	1.6	23.1	855
RS/SXCAG-2Y2Y(K)2YBH-7P1.5S	7	1.0	0.8	1.7	26.1	1095
RS/SXCAG-2Y2Y(K)2YBH-14P1.5S	14	1.2	0.8	1.8	32.3	1616
RS/SXCAG-2Y2Y(K)2YBH-24P1.5S	24	1.2	1.1	2.0	38.3	2260
RS/SXCAG-2Y2Y(K)2YBH-30P1.5S	30	1.2	1.1	2.2	42.8	2625

Anti Induction


Buried in Ground


Laid In Ducts

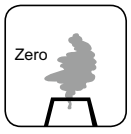
PVC Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

LSZH Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

SW-CLT Switching Centre Cables

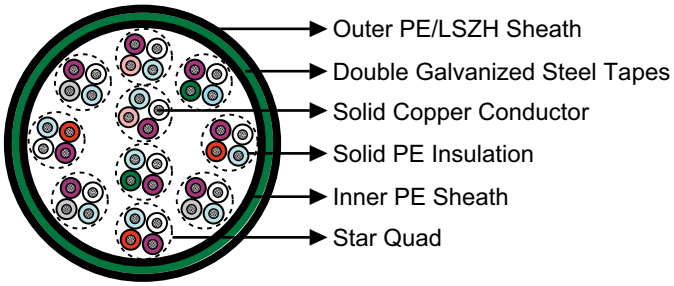
Applications

The cables are used as block cables for railway. The cables are suitable for connection between local switching centre and the trackside and signalling equipments.

Standards

- CFF: I-EB-SK 3001.82.1000

Construction



- Conductors：Class 1 solid copper, 1.0/1.5/2.2mm nominal diameter
- Insulation：Solid polyethylene.
- Cabling Element：Four conductors are twisted together to form a quad.
- Inner Sheath：PE sheath.
- Armour：Double galvanized steel tapes of 0.15mm.
- Outer Sheath：PE/LSZH sheath.

Optionally

Unarmoured Cable: The cables offered without galvanized steel tapes (SW).

Traction Armoured Cable: The cables offered with galvanized steel flat wire armour with or without protection sheath (SW-F/FT).

Halogenfree Sheathed Cable: The cables offered with LSZH sheath according to IEC 60332-3C (SW-CLN/FN).

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	1.0	1.5	2.2
Maximum Conductor Resistance (DC)	Ω/km	47.0	20.9	10.0
Minimum Insulation Resistance @500 V DC (3mins)	MΩ.km	10000	10000	10000
Maximum Mutual Capacitance @800Hz	nF/km	42	52	60
Maximum Capacitance Unbalance				
In quad	pF/km	400	400	400
Between quads	pF/km	400	400	400
Real-ground	pF/km	650	650	650
Operating Voltage AC/DC	V	500/800		

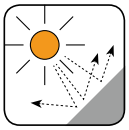
Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -30℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

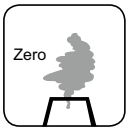
Dimensions and Weight

Cable Code	No. of Quads	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
1.0mm Conductor, 1.8mm insulated Wire					
RS/SW-CLT-2Y2YB2Y-1Q1	1	1.0	1.5	12.7	161
RS/SW-CLT-2Y2YB2Y-2Q1	2	1.0	1.5	17.5	335
RS/SW-CLT-2Y2YB2Y-3Q1	3	1.0	1.7	18.3	390
RS/SW-CLT-2Y2YB2Y-4Q1	4	1.0	1.7	20.4	455
RS/SW-CLT-2Y2YB2Y-5Q1	5	1.0	1.7	21.7	543
RS/SW-CLT-2Y2YB2Y-7Q1	7	1.2	1.8	23.3	640
RS/SW-CLT-2Y2YB2Y-10Q1	10	1.2	2.0	28.4	896
RS/SW-CLT-2Y2YB2Y-15Q1	15	1.2	2.2	33.0	1260
RS/SW-CLT-2Y2YB2Y-20Q1	20	1.2	2.3	37.1	1590
RS/SW-CLT-2Y2YB2Y-25Q1	25	1.2	2.4	41.7	1960
RS/SW-CLT-2Y2YB2Y-30Q1	30	1.3	2.5	43.2	2130
1.5mm Conductor, 2.8mm Insulated Wire					
RS/SW-CLT-2Y2YB2Y-1Q1.5	1	1.0	1.5	13.1	240
RS/SW-CLT-2Y2YB2Y-2Q1.5	2	1.0	1.5	20.4	491
RS/SW-CLT-2Y2YB2Y-3Q1.5	3	1.0	1.7	21.4	585
RS/SW-CLT-2Y2YB2Y-4Q1.5	4	1.0	1.7	23.1	684
RS/SW-CLT-2Y2YB2Y-5Q1.5	5	1.0	1.7	25.5	488
RS/SW-CLT-2Y2YB2Y-7Q1.5	7	1.2	1.8	27.4	1030
RS/SW-CLT-2Y2YB2Y-10Q1.5	10	1.2	2.0	33.7	1460
RS/SW-CLT-2Y2YB2Y-15Q1.5	15	1.2	2.2	39.2	2060
RS/SW-CLT-2Y2YB2Y-20Q1.5	20	1.2	2.3	43.4	2600
RS/SW-CLT-2Y2YB2Y-25Q1.5	25	1.2	2.4	50.1	3300
RS/SW-CLT-2Y2YB2Y-30Q1.5	30	1.3	2.5	51.8	3660
2.2mm Conductor, 3.8mm Insulated Wire					
RS/SW-CLT-2Y2YB2Y-1Q2.2	1	1.0	1.5	15.1	346
RS/SW-CLT-2Y2YB2Y-2Q2.2	2	1.0	1.5	23.6	573
RS/SW-CLT-2Y2YB2Y-3Q2.2	3	1.0	1.7	24.4	934
RS/SW-CLT-2Y2YB2Y-4Q2.2	4	1.0	1.7	27.5	1329
RS/SW-CLT-2Y2YB2Y-5Q2.2	5	1.0	1.7	30.5	1380
RS/SW-CLT-2Y2YB2Y-7Q2.2	7	1.2	1.8	32.9	1730
RS/SW-CLT-2Y2YB2Y-10Q2.2	10	1.2	2.0	42.5	2560
RS/SW-CLT-2Y2YB2Y-15Q2.2	15	1.2	2.2	49.2	3630
RS/SW-CLT-2Y2YB2Y-20Q2.2	20	1.2	2.3	57.0	4780
RS/SW-CLT-2Y2YB2Y-25Q2.2	25	1.2	2.4	62.8	5850
RS/SW-CLT-2Y2YB2Y-30Q2.2	30	1.3	2.5	64.4	6580

Anti Induction


UV Resistant


Water Resistant



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Buried in Ground


Laid In Ducts

Twin Datalink Cable

Application

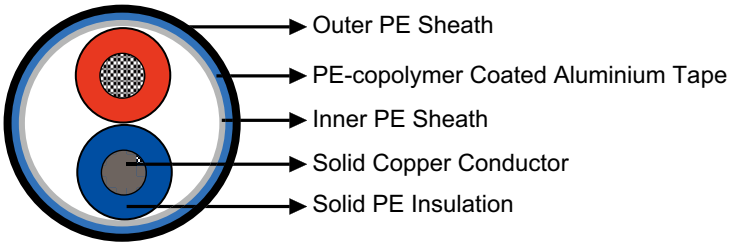
The cables are used as interconnecting cables for Solid State Interlocking (SSI) systems.

Standards

- BR 1932

Construction

- Conductors: Class 1 solid plain copper conductor, 1.27mm nominal diameter.
- Insulation: Solid polyethylene.
- Inner Sheath: Low density polyethylene.
- Moisture barrier: PE Copolymer coated aluminium tape.
- Sheath: Low density polyethylene.
- Core Identification: Blue & Red



Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	1.27
Nominal Conductor Cross Section	mm^2	2.5
Maximum Conductor Resistance	Ω/km	7.41

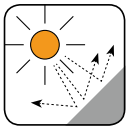
Mechanical and Thermal Properties

- Minimum Bending Radius: 6xOD
- Temperature Range: -25℃ to +85℃ (during operation); -10℃ to +85℃ (during installation)

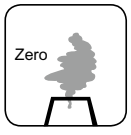
Dimensions and Weight

Cable Code	No. of pairs	Nominal Sheath Thickness mm	Overall Diameter Min/Max mm	Nominal Weight kg/km
1.27mm Conductor, 2.59mm Insulation Wire				
RS1932-2Y2Y(L)2Y-1P1.27	1	2.5	12.47/12.8	136

Anti Induction


UV Resistant


Water Resistant



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Rated Voltage


Buried in Ground


Laid In Ducts

RT/F3 D & S & B type Axle Counter Cable

Applications

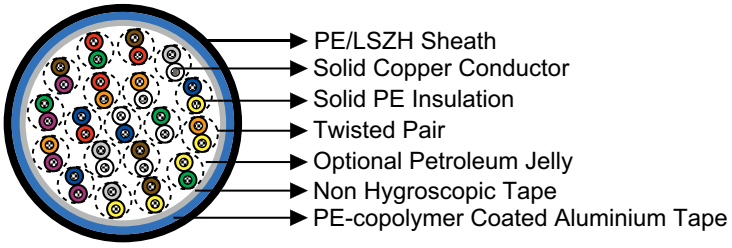
The cables are designed for transmission of signals up to 90 kHz in axle counter train detection systems.

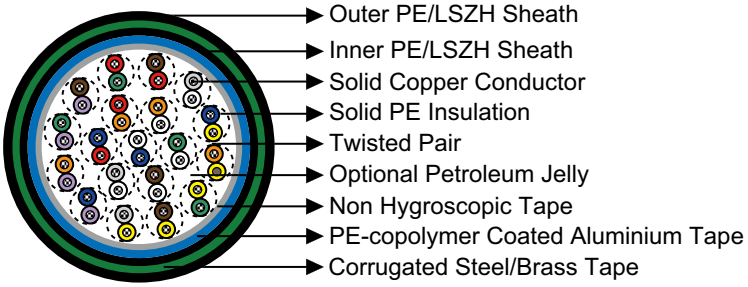
Standards

- RT/E/PS/00031

Construction

- Conductors: Tinned copper, 0.9/1.4 mm nominal diameter.
- Insulation: Solid polyethylene.
- Cabling Element: Two insulated conductors are twisted together to form a pair.
- Stranding: Pairs are helically stranded in concentric layers.
- Filling: Cable core interstices are filled with a low-permitivity compound. Unfilled cables option can be offered upon request.
- Core Wrapping: Plastic tape(s) with overlapping.
- Moisture Barrier: One laminated sheath made of aluminium tape coated with PE-Copolymer on at least one side is applied with longitudinally overlap.





- Inner Sheath (for S/B type): Polyethylene or LSZH fire retardant compound.
- Mechanical Protection (for S/B type): One corrugated steel tape or brass tape is longitudinally applied with overlap. Unarmoured cables option can be offered upon request.
- Outer Sheath: Polyethylene or LSZH fire retardant compound. Ruggedised PE sheath compound can be offered upon request.

Type Codes

F1 class: Non LSZH cables.

F5 class: Unfilled cables

D type: Unarmoured types

R type: Ruggedised PE sheath

S type: Steel tape armoured types

B type: Brass tape armoured types

E1, E2 & E3 types: 3 different induction protection levels available.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.9	1.4
Nominal Conductor Cross Section	mm^2	0.63	1.5
Maximum Conductor Resistance	Ω/km	30.0	12.5
Minimum Insulation Resistance @500 V DC (1min)	MΩ.km	5000	5000
Nominal Conductor Capacitance @800Hz/1000Hz (AC)	nF/km	42+3	47+3
Dielectric Strength, conductor to screen (DC voltage 2mins)	V	3000	3000
Maximum Average Attenuation			
@1.0KHz	dB/km	0.73	0.45
@2.4KHz	dB/km	1.10	0.62
@40KHz	dB/km	2.88	1.77
@90KHz	dB/km	3.70	2.41
@1.024MHz	dB/km	11.2	7.45
Minimum Average Near-end Crosstalk			
@1.0KHz	dB/km	60	60
@2.4KHz	dB/km	60	60
@40KHz	dB/km	50	50
@90KHz	dB/km	50	50
@1.024MHz	dB/km	35	35

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD (unarmoured); 10xOD (armoured)
- Temperature Range: -30℃ to +60℃ (during operation); -10℃ to +60℃ (during installation)

Core Identification:

Pair Number	A Wire	B Wire	Pair Number	A Wire	B Wire
1	WHITE	BLUE	13	YELLOW	GREEN
2	WHITE	ORANGE	14	YELLOW	BROWN
3	WHITE	GREEN	15	YELLOW	GREY
4	WHITE	BROWN	16	VIOLET	BLUE
5	WHITE	GREY	17	VIOLET	ORANGE
6	RED	BLUE	18	VIOLET	GREEN
7	RED	ORANGE	19	VIOLET	BROWN
8	RED	GREEN	20	VIOLET	GREY
9	RED	BROWN	21	TURQUOISE	BLUE
10	RED	GREY	22	TURQUOISE	ORANGE
11	YELLOW	BLUE	23	TURQUOISE	GREEN
12	YELLOW	ORANGE	24	TURQUOISE	BROWN

Two pair cables laid up in quad formation colour coded in rotation, Orange, White, Green, Black

Dimensions and Weight

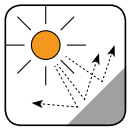
AJ -2Y(L)2Y n x2x 0.9/1.4 Cables

Cable Code	Number of Pairs (n)	Nominal Sheath Thickness mm	Maximum Overall Diameter mm	Nominal Weight kg/km
0.9mm conductor, 1.55mm Insulated wire				

Cable Code	Number of Pairs (n)	Nominal Sheath Thickness mm	Maximum Overall Diameter mm	Nominal Weight kg/km
RS/RT/F3-D-2Y(F)(L)2Y-2P0.9	2	2.4	13.2	210
RS/RT/F3-D-2Y(F)(L)2Y-10P0.9	10	2.4	21.6	530
RS/RT/F3-D-2Y(F)(L)2Y-12P0.9	12	2.4	24.8	580
RS/RT/F3-D-2Y(F)(L)2Y-19P0.9	19	2.4	31.2	800
RS/RT/F3-D-2Y(F)(L)2Y-24P0.9	24	2.4	33.8	980
1.4mm conductor, 2.2mm Insulated wire				
RS/RT/F3-D-2Y(F)(L)2Y-2P1.4	2	2.4	23.4	320
RS/RT/F3-D-2Y(F)(L)2Y-10P1.4	10	2.4	30.0	910
RS/RT/F3-D-2Y(F)(L)2Y-12P1.4	12	2.4	32.0	1101
RS/RT/F3-D-2Y(F)(L)2Y-19P1.4	19	2.4	37.3	1450
RS/RT/F3-D-2Y(F)(L)2Y-24P1.4	24	2.4	42.3	1780

AJ-2Y(L)2YB2Y n x2x 0.9/1.4 Cables

Cable Code	Number of Pairs (n)	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.9mm conductor, 1.8mm Insulated wire					
RS/RT/F3-S-2Y(L)2YB2Y-2P0.9	2	2.2	2.4	22.0	399
RS/RT/F3-S-2Y(L)2YB2Y-10P0.9	10	2.2	2.4	30.4	880
RS/RT/F3-S-2Y(L)2YB2Y-12P0.9	12	2.2	2.4	33.6	963
RS/RT/F3-S-2Y(L)2YB2Y-19P0.9	19	2.2	2.4	40.0	1312
RS/RT/F3-S-2Y(L)2YB2Y-24P0.9	24	2.2	2.4	42.6	1626
1.4mm conductor , 2.7mm Insulated wire					
RS/RT/F3-S-2Y(L)2YB2Y-2P1.4	2	2.2	2.4	32.2	608
RS/RT/F3-S-2Y(L)2YB2Y-10P1.4	10	2.2	2.4	38.8	1510
RS/RT/F3-S-2Y(L)2YB2Y-12P1.4	12	2.2	2.4	40.8	1827
RS/RT/F3-S-2Y(L)2YB2Y-19P1.4	19	2.2	2.4	46.1	2380
RS/RT/F3-S-2Y(L)2YB2Y-24P1.4	24	2.2	2.4	51.1	2954


UV Resistant


Water Resistant

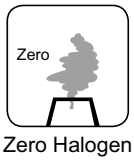
Rated voltage


Impact Resistant


Buried in Ground


Laid In Ducts

PE Sheath

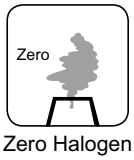


Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

LSZH Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

RT/F3 E1/E2/E3 Type Axle Counter Cable

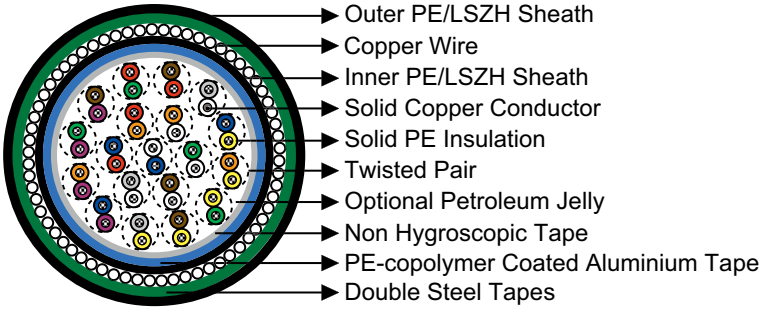
Applications

The cables are designed for transmission of signals up to 90 kHz in axle counter train detection systems.

Standards

- RT/E/PS/00031

Construction



- Conductors: Tinned copper wire, 0.9 or 1.4 mm nominal diameter.
- Insulation: Solid polyethylene.
- Cabling Element: Two insulated conductors are twisted together to form a pair.
- Stranding: Pairs are helically stranded in concentric layers.
- Filling: Cable core interstices are filled with a low-permitivity compound. Unfilled cables option can be offered upon request.
- Core wrapping: Plastic tape(s) with overlapping
- Moisture barrier: One laminated sheath made of aluminium tape coated with PE-Copolymer on at least one side is applied with longitudinally overlap.
- Inner sheath: Polyethylene or LSZH fire retardant compound.
- Electrostatic shield: One layer of helically applied copper wires.
- Electromagnetic shield: Two helically applied steel tapes.
- Outer sheath: Polyethylene or LSZH fire retardant compound. Ruggedised PE sheath compound can be offered upon request.

Type Codes

F1 class: Non LSZH cables.

F5 class: Unfilled cables

D type: Unarmoured types

R type: Ruggedised PE sheath

S type: Steel tape armoured types

B type: Brass tape armoured types

E1, E2 & E3 types: 3 different induction protection levels available.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.9	1.4
Nominal Conductor Cross Section	mm^2	0.63	1.5
Maximum Conductor Resistance	Ω/km	30.0	12.5
Minimum Insulation Resistance @500 V DC (1min)	MΩ.km	5000	5000
Nominal Mutual Capacitance @800Hz/1000Hz (AC)	nF/km	42+3	47+3
Dielectric Strength, conductor to screen (DC voltage 2mins)	V	3000	3000
Maximum Average Attenuation			
@1.0KHz	dB/km	0.73	0.45
@2.4KHz	dB/km	1.10	0.62
@40KHz	dB/km	2.88	1.77
@90KHz	dB/km	3.70	2.41
@1.024MHz	dB/km	11.2	7.45
Minimum Average Near-end Crosstalk Attenuation			
@1.0KHz	dB/km	60	60
@2.4KHz	dB/km	60	60
@40KHz	dB/km	50	50
@90KHz	dB/km	50	50
@1.024MHz	dB/km	35	35
Maximum Reduction factor @100V/km,50Hz			
EMI RF 1 (modest level)		0.65	0.65
EMI RF 2 (medium level)		0.45	0.45
EMI RF 3 (high level)		0.20	0.20

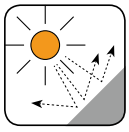
Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD (unarmoured); 10xOD (armoured)
- Temperature Range: -30℃ to +60℃ (during operation); -10℃ to +60℃ (during installation)

Dimensions and Weight

Cable Code	Number of Pairs	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.9mm conductor , 1.8mm Insulated wire					
RS/RT/F3-S/E3-2Y(F)(L)2YDB2Y-2P0.9	2	2.2	2.4	23.4	1300
RS/RT/F3-S/E3-2Y(F)(L)2YDB2Y-10P0.9	10	2.2	2.4	31.8	1650
RS/RT/F3-S/E3-2Y(F)(L)2YDB2Y-12P0.9	12	2.2	2.4	35.0	1760
RS/RT/F3-S/E3-2Y(F)(L)2YDB2Y-19P0.9	19	2.2	2.4	41.4	2275
RS/RT/F3-S/E3-2Y(F)(L)2YDB2Y-24P0.9	24	2.2	2.4	44.0	2450
1.4mm conductor, 2.7mm Insulated wire					
RS/RT/F3-S/E3-2Y(F)(L)2YDB2Y-2P1.4	2	2.2	2.4	33.6	1480
RS/RT/F3-S/E3-2Y(F)(L)2YDB2Y-10P1.4	10	2.2	2.4	40.2	2200
RS/RT/F3-S/E3-2Y(F)(L)2YDB2Y-12P1.4	12	2.2	2.4	42.2	2325
RS/RT/F3-S/E3-2Y(F)(L)2YDB2Y-19P1.4	19	2.2	2.4	47.5	2975
RS/RT/F3-S/E3-2Y(F)(L)2YDB2Y-24P1.4	24	2.2	2.4	52.5	3150

Anti Induction


UV Resistant


Water Resistant

Rated voltage


Impact Resistant


Buried in Ground


Laid In Ducts

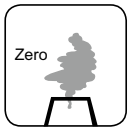
PE Sheath

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

LSZH Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

SPFB Speed Control System Cables

Applications

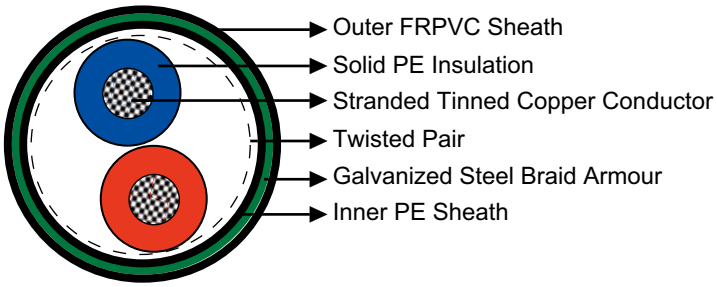
The cables are used for the train speed control system (French system KVB). The cables are laid along railway lines and connect the speed sensors (located between the rails) to the encoder located inside the trackside equipment shelter.

Standards

- SNCF CT 446

Construction

- Conductors: Class 2 stranded tinned copper.
- Insulation: Solid polyethylene.
- Cabling Element: Twisted pair.
- Inner Sheath: Low density polyethylene.
- Armour: Galvanized steel braid armour.
- Outer Sheath: Flame Retardant PVC.



Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.8
Nominal Cross Section Area	mm sq	0.5
Maximum Conductor Resistance (DC)	Ω/km	36
Characteristic Impedance @100KHz	Ω	120
Maximum Attenuation @50KHz	dB/km	5
Nominal Insulation Thickness	mm	0.55
Operating Voltage	V	500

Mechanical and Thermal Properties

- Minimum Bending Radius: 8xOD (static); 16xOD (dynamic)
- Temperature Range: -30℃ to +70℃ (during operation); -20℃ to +50℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
			Inner	Outer		
RT/SPFB-2Y2Y(SWB)2Y-2C0.5S	2 x 0.5	7/0.32	1.0	1.5	9.1	97


Flexible


Ozone Resistant


Fuel Oil Resistant


Mineral Oil Resistant


Laid In Ducts/ Channel


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

EUROBALISE SIF

Applications

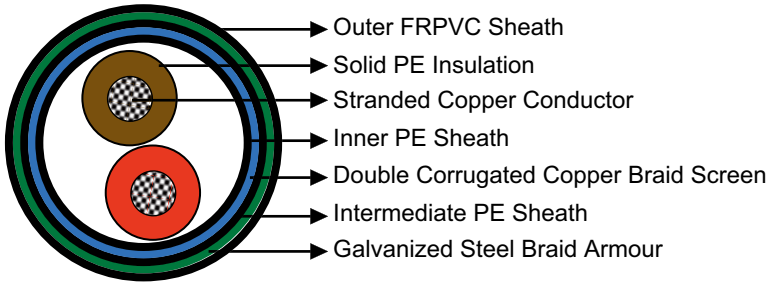
The cables are used in Eurobalise (ERTMS) speed control circuits. The cables are laid in trays alongside railway lines and connect an "Eurobalise" located between the rails to the Eurocoder (LEU) located in a control centre.

Standards

- ALSTOM 5 326 203
- SNCF CT 446

Construction

- Conductors: Class 2 stranded copper.
- Insulation: Solid polyethylene.
- Inner sheath: Low density polyethylene.
- Screen: Two corrugated copper braid shields.
- Intermediate Sheath: Low density polyethylene.
- Armour: Galvanized steel braid armour.
- Outer sheath: Flame Retardant PVC.



Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	1.04
Nominal Cross Section Area	mm sq	0.85
Maximum Conductor Resistance (DC)	Ω/km	22
Nominal Characteristic Impedance @100 KHz-1MHz	Ω	95
Maximum Attenuation		
@560 kHz	dB/km	7.5
@1MHz	dB/km	10
Nominal Insulated Thickness	mm	0.63

Mechanical and Thermal Properties

- Minimum Bending Radius: 8xOD (static); 16xOD (dynamic)
- Temperature Range: -30℃ to +70℃ (during operation); -20℃ to +50℃ (during installation)

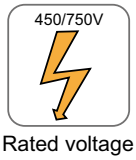
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm			Nominal Overall Diameter mm	Nominal Weight kg/km
			Inner	Inter.	Outer		
RS/SIF-2Y2Y(St)2Y(SWB)Y-2C0.85S	2 x 0.85	7/0.386	1.0	0.8	1.6	15	301


Mineral Oil Resistant


Fuel Oil Resistant


Ozone Resistant



Rated voltage


Laid In Ducts/ Channel


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

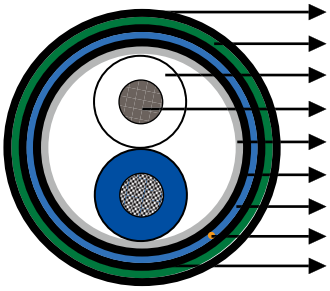
EUROBALISE BGA

Applications

The cables are used as balise cables for ERTMS (European Rail Traffic Management System) railway networks. The cables are armoured and can provide low reduction factor.

Standards

- CEI 20-11
- CEI 20-14
- CEI 20-29
- CEI 20-34
- CEI 46-4
- CEI 103-10



Construction

- Conductors: Solid annealed copper, 1.6 mm nominal diameter.
- Insulation: Solid polyethylene.
- Stranding: Conductors will be stranded with dielectric fillers in order to get a circular core shape.
- Core wrapping: Plastic tape (s) with overlapping.
- Inner sheath: Low density polyethylene.
- Screen: Aluminium/polyethylene tape longitudinally applied and overlapped.
- Drain Wire: Tinned copper drain wire
- Intermediate sheath: Low density polyethylene.
- Armour: Two galvanized steel tapes.
- Outer sheath: Low density polyethylene.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	1.6
Maximum Conductor Resistance (DC)	Ω/km	21.5
Mutual Capacitance	Ω/km	8.21
Nominal Characteristic Impedance @8.9 kHz	Ω	130
Nominal Characteristic Impedance @560 kHz	Ω	110
Maximum Attenuation @560 kHz	dB/km	3.8
Insulation Resistance	MΩ.km	10000
Minimum Dielectric Strength core to screen (DC)	V	1000
Minimum Dielectric Strength core to core (DC)	V	3000
Reduction Factor @100V/km		0.6

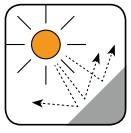
Mechanical and Thermal Properties

- Minimum Bending Radius: 8xOD (static); 16xOD (dynamic)
- Temperature Range: -30℃ to +70℃ (during operation); -20℃ to +50℃ (during installation)

Dimensions and Weight

Cable Code	Number of Pairs	Nominal Sheath Thickness mm			Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Inter.	Outer		
1.6mm Conductor, 3.4mm Insulated Wire						
RS/BGA-2Y2Y(L)2YB2Y-1P1.6	1	1.0	0.8	1.6	16	334

Anti Induction

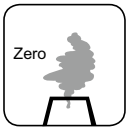

UV Resistant


Water Resistant


Mineral Oil Resistant

Rated Voltage


Laid In Ducts



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

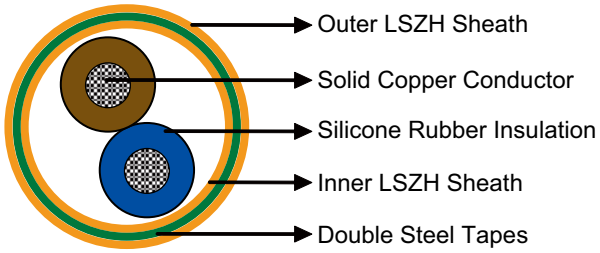
K27 Fire Resisting Control Cables (CR1-C1 Class)

Applications

The cables are designed for provide circuit integrity for safety lightning, smoke extraction, ventilation, emergency telephone and exits during fire for underground railways.

Standards

- RATP K27 specification
- Fire resistant: class CR1
- No fire propagation: class C1 RATP (<30cm)



Construction

- Conductors: Class 1 solid conductor from 1.5mm^2 to 4mm^2; class 2 stranded conductor for 6mm^2.
- Insulation: Silicone rubber insulation.
- Stranding: Cores are helically stranded in concentric layers.
- Inner Sheath: LSZH.
- Armour: Two layers of steel tape.
- Outer Sheath: LSZH.

Electrical Characteristics at 20□

Number of strands/Noml Conductor Diameter	mm	7/1.04	1/1.39	1/1.79	1/2.25
Nominal Cross Section Area	mm sq	6	1.5	2.5	4
Nominal Insulation Thickness	mm	1.0	0.8	1.0	1.0
Operating Voltage	V	300/500			

Mechanical and Thermal Properties

- Minimum Bending Radius: 5xOD (static); 10xOD (dynamic)
- Temperature Range: -10℃ to +90℃ (during operation); -10℃ to +60℃ (during installation)

Dimensions and Weight

Cable Code	Number of Cores	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
7/1.04mm Conductor, 4.76mm Insulated Wire					

Cable Code	Number of Cores	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
RS/K27-2GHBH-2C6S-FR	2	1.0	1.5	17.0	406
1/1.39mm Conductor, 2.99mm Insulated Wire					
RS/K27-2GHBH-2C1.5S-FR	2	1.0	1.5	11.3	200
RS/K27-2GHBH-3C1.5S-FR	3	1.0	1.5	12.5	237
RS/K27-2GHBH-12C1.5S-FR	12	1.0	1.5	18.9	596
1/1.79mm Conductor, 3.79mm Insulated Wire					
RS/K27-2GHBH-2C2.5S-FR	2	1.0	1.5	13.2	265
RS/K27-2GHBH-3C2.5S-FR	3	1.0	1.5	13.5	309
1/2.25mm Conductor, 4.26mm Insulated wire					
RS/K27-2GHBH-2C4S-FR	2	1.0	1.5	14.7	325
RS/K27-2GHBH-3C4S-FR	3	1.0	1.5	15.6	411


Impact Resistant

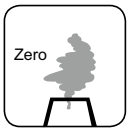

Mineral Oil Resistant


Acid&Alkaline Resistant


Laid In conduit


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

Insulation Integrity FE180
EN 50200/IEC 60331
/NF C32-070-2.3(CR1)

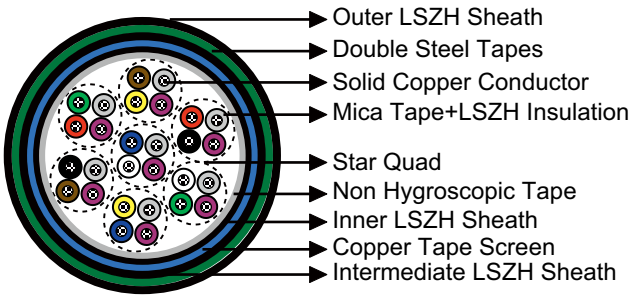
MD4 Fire Resisting Telecom Cables (CR1-C1 Class)

Applications

The cables are telecommunication cables for tunnel application. The cables are halogen free fire resistant, inductive protected and armoured.

Standards

- Fire retardant: NBN C 30-004 F2
- Fire resistant: NBN 713-020 Add.3. -RF 1h



Construction

- Conductors: Solid copper conductor, 0.5mm sq nominal cross section area.
- Insulation: Mica-tape + LSZH insulation.
- Cabling Element : Four conductors are twisted to form a quad.
- Stranding: Quads are helically stranded in concentric layers.
- Core Wrapping: Plastic tape(s) with overlapping.
- Inner Sheath: LSZH sheath.
- Screen: Copper tape screen.
- Intermediate Sheath: LSZH sheath.
- Armour: Two layer of steel tape.
- Outer Sheath: LSZH sheath.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.8
Nominal Cross Section Area	mm sq	0.5
Nominal Insulation Thickness	mm	0.5
Maximum Conductor Resistance (DC)	Ω/km	36.7
Minimum Insulation Resistance	MΩ.km	100
Maximum Capacitance	nF/km	120
Voltage Test 2 mins	KV_{ac}	0.5

Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

Cable Code	No. of Quads	Nominal Sheath Thickness mm			Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Interm.	Outer		
0.8mm conductor, 1.8mm Insulated Wire						
RS/MD4-HH(K)HBH-7Q0.8-FR	7	1.0	1.0	1.8	30.7	1074

Anti Induction

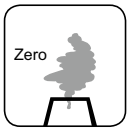
Rated Voltage


Laid In Ducts


Buried in Ground


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

Insulation Integrity FE180
EN 50200/IEC 60331
/NF C32-070-2.3(CR1)

RAILWAY TELECOM CABLES

Telecommunication Cables for Outdoor Plant

UK Network Rail Standard
UK London Underground Standard
France RATP Railway Standard

Telecommunication Cables for Indoor Plant

France RATP Railway Standard

RT/ZHLS, A-2Y(L)2Y External Telephone Cables to NR/PS/TEL/00015

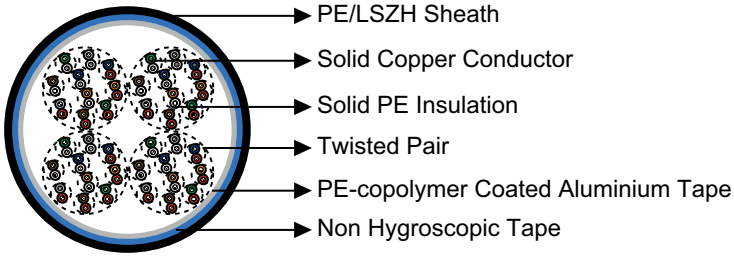
Applications

The cables are designed primarily for trackside railway installation in non electrified area. For direct burial application, brass tape armoured or Zetabon type corrugated steel tape armoured can be offered against rodent attack.

Standards

- NR/PS/TEL/00015 (formerly RT/E/PS/00015 or GK/RT 0315)
- TS0886/BR1822
- BR892

Construction



- Conductors: Solid plain copper conductor, 0.63 or 0.9 mm nominal diameter.
- Insulation: Solid polyethylene to BS6234.
- Cabling Element: Two insulated conductors are twisted together to form a pair.
- Stranding: Pairs are helically stranded in 10 pair units.
- Core Wrapping: Plastic tape(s) with overlapping.
- Moisture Barrier: One laminated sheath made of aluminium tape (0.15mm) coated with PE-Copolymer on at least one side is applied with longitudinally overlap.
- Outer Sheath: Polyethylene to BS6234. LSZH compound option can be offered upon request.

Optionally

Jelly Filled Cables: The cable core interstices are filled with petroleum jelly to avoid longitudinal water penetration within the cable. The water resistant filling compound is applied to the air space between non-hygroscopic tape and shield, shield and sheath within the cable core.

Armoured Cables: Corrugated steel tape armour coated on both sides with copolymer can be applied over an intermediate sheath. The steel tape thickness is 0.145mm. Brass tape armour can be offered as an option.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.63	0.9
Maximum Conductor Resistance	Ω/km	60.0	30.0
Minimum Insulation Resistance @500 V DC (1min)	MΩ.km	1500	1500
Maximum Conductor Capacitance @1000Hz (AC)			

Maximum Average Value			
For 20 pairs or less	nF/km	70	79
More than 20 pairs	nF/km	67	75
Maximum Individual Value 99% of pairs			
Up to 20 pairs	nF/km	79.0	85.0
More than 20 pairs	nF/km	75.0	81.0
Maximum Capacitance Unbalance @1000Hz pair to pair (99% of pairs)			
For 2 pairs (1 quad)	pF/500m	800	800
All other sizes	pF/500m	275	275
Dielectric Strength, conductor to screen (DC voltage 2mins)	V	2000	2000
Maximum Average Attenuation			
@1.0KHz	dB/km	1.40	0.95
@2.4KHz	dB/km	2.15	1.46
@1.024MHz	dB/km	18.70	14.6
Minimum Average Near-end Crosstalk			
@1.0KHz	dB/km	70	70
@2.4KHz	dB/km	65	65
@1.024MHz			
Within Units	dB/km	40	40
Between Units	dB/km	47	47
High Voltage Breakdown Test			
DC for 2mins	V	2000	2000
AC for 2mins	V	1333	1333

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD (unarmoured); 10XOD (armoured)
- Temperature Range: -40℃ to +70℃ (during operation); -10℃ +60℃ (during installation)

Core Identification

Colour scheme, unit binder colour and cable make-up according to NR/PS/TEL/00015

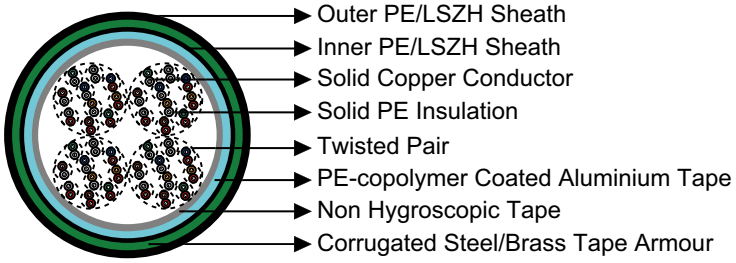
Pair Number	A Wire	B Wire	Unit Number	Binder Colour	Cable Size	Number and Pair Size of Unit	
						Centre	1st Layer
1	WHITE	BLUE	1	BLUE	2	1x2	-
2	WHITE	ORANGE	2	ORANGE	5	1x5	-
3	WHITE	GREEN	3	GREEN	10	1x10	-
4	WHITE	BROWN	4	BROWN	20	4x5	-
5	WHITE	GREY	5	GREY	20	2x10	-
6	RED	BLUE	6	WHITE	30	6x5	-
7	RED	ORANGE	7	RED	30	3x10	-
8	RED	GREEN	8	BLACK	50	5x10	-
9	RED	BROWN	9	YELLOW	50	1x10	4x10
10	RED	GREY	10	VIOLET	75	3x5	6x10
					100	2x10	8x10
					100	3x10	7x10
					100	4x5	8x10

Dimensions and Weight

AJ-2Y(L)2Y n x2x 0.63/0.9

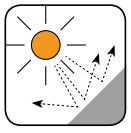
Cable Code	Number of Pairs (n)	Nominal Sheath Thickness mm	Maximum Overall Diameter mm	Nominal Weight kg/km
0.63mm conductor, 1.15mm Insulated Wire				
RS/RT/ZHLS-2Y(L)2Y-2P0.63	2	2.7	12.3	103
RS/RT/ZHLS-2Y(L)2Y-5P0.63	5	2.7	13.8	155

Cable Code	Number of Pairs (n)	Nominal Sheath Thickness mm	Maximum Overall Diameter mm	Nominal Weight kg/km
RS/RT/ZHLS-2Y(L)2Y-10P0.63	10	2.7	15.6	212
RS/RT/ZHLS-2Y(L)2Y-20P0.63	20	2.7	18.1	309
RS/RT/ZHLS-2Y(L)2Y-30P0.63	30	2.7	20.4	403
RS/RT/ZHLS-2Y(L)2Y-50P0.63	50	2.7	24.2	574
RS/RT/ZHLS-2Y(L)2Y-75P0.63	75	2.7	28.2	779
RS/RT/ZHLS-2Y(L)2Y-100P0.63	100	2.7	31.0	974
0.9mm conductor, 1.5mm Insulated Wire				
RS/RT/ZHLS-2Y(L)2Y-2P0.9	2	2.7	13.3	131
RS/RT/ZHLS-2Y(L)2Y-5P0.9	5	2.7	15.6	208
RS/RT/ZHLS-2Y(L)2Y-10P0.9	10	2.7	18.1	305
RS/RT/ZHLS-2Y(L)2Y-20P0.9	20	2.7	21.9	477
RS/RT/ZHLS-2Y(L)2Y-30P0.9	30	2.7	25.2	639
RS/RT/ZHLS-2Y(L)2Y-50P0.9	50	2.7	30.0	951
RS/RT/ZHLS-2Y(L)2Y-75P0.9	75	2.7	35.8	1325
RS/RT/ZHLS-2Y(L)2Y-100P0.9	100	2.7	39.1	1688



AJ-2Y(F)(L)2YB2Y n x2x 0.63/0.9 Jelly Filled & Armoured Cables

Cable Code	Number of Pairs (n)	Nominal Sheath Thickness mm		Maximum Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.63mm conductor, 1.15mm Insulated Wire					
RS/RT/ZHLS-2Y(F)(L)2YB2Y-2P0.63	2	1.6	1.6	18.0	222
RS/RT/ZHLS-2Y(F)(L)2YB2Y-5P0.63	5	1.6	1.6	19.5	296
RS/RT/ZHLS-2Y(F)(L)2YB2Y-10P0.63	10	1.6	1.6	20.3	383
RS/RT/ZHLS-2Y(F)(L)2YB2Y-20P0.63	20	1.6	1.6	23.8	504
RS/RT/ZHLS-2Y(F)(L)2YB2Y-30P0.63	30	1.6	1.6	26.1	606
RS/RT/ZHLS-2Y(F)(L)2YB2Y-50P0.63	50	1.6	1.6	29.9	903
RS/RT/ZHLS-2Y(F)(L)2YB2Y-75P0.63	75	1.6	1.6	33.9	1202
RS/RT/ZHLS-2Y(F)(L)2YB2Y-100P0.63	100	1.6	1.6	36.7	1463
0.9mm conductor, 1.5mm Insulated Wire					
RS/RT/ZHLS-2Y(F)(L)2YB2Y-2P0.9	2	1.6	1.6	19.0	250
RS/RT/ZHLS-2Y(F)(L)2YB2Y-5P0.9	5	1.6	1.6	21.3	370
RS/RT/ZHLS-2Y(F)(L)2YB2Y-10P0.9	10	1.6	1.6	23.8	508
RS/RT/ZHLS-2Y(F)(L)2YB2Y-20P0.9	20	1.6	1.6	27.6	782
RS/RT/ZHLS-2Y(F)(L)2YB2Y-30P0.9	30	1.6	1.6	30.9	1000
RS/RT/ZHLS-2Y(F)(L)2YB2Y-50P0.9	50	1.6	1.6	35.7	1402
RS/RT/ZHLS-2Y(F)(L)2YB2Y-75P0.9	75	1.6	1.6	41.5	2055
RS/RT/ZHLS-2Y(F)(L)2YB2Y-100P0.9	100	1.6	1.6	44.8	2550

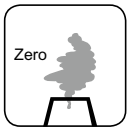

UV Resistant


Water Resistant

Rated Voltage


Laid In Ducts


Buried in Ground



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Scada/Pilot Cables NR/PS/ELP/27220

Applications

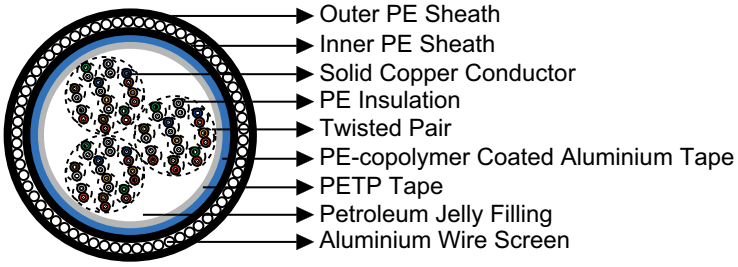
The telecom cables are suitable for modem based supervisory system operating in the VF range from 300 to 3000Hz.

Standards

- NR/PS/ELP/27220 (formerly RT/E/PS/0034)

Construction

- Conductors: Class 1 solid plain copper conductor 0.9 mm nominal diameter to BS6360, complies with BS3573.
- Insulation: Solid polyethylene type 03 to BS6234.
- Cabling Element: Two insulated conductors are twisted together to form a pair.



- Filling: Petroleum jelly filled.
- Core Wrapping: PETP (Polyethylene Terephthalate) tape.
- Moisture Barrier: One laminated sheath made of aluminium tape coated with PE-Copolymer on at least one side is applied with longitudinally overlap.
- Inner Sheath: Low density polyethylene type 03C to BS6234.
- Screen: Aluminium wire screen.
- Core Wrapping: Water blocking tape.
- Sheath: Low density polyethylene type 03C to BS6234.

Electrical Characteristics at 20□

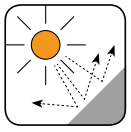
Nominal Conductor Diameter	mm	0.9
Maximum Conductor Resistance	Ω/km	30.0
Maximum Average Mutual Capacitance @1000Hz (AC)	nF/km	71
Maximum Capacitance Unbalance @1000Hz pair to pair	pF/500m	275

Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -25℃ to +85℃ (during operation); -10℃ to +70℃ (during installation)

Dimensions and Weight

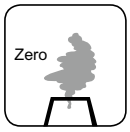
Cable Code	Number of Pairs	Nominal Sheath Thickness mm	Maximum Overall Diameter mm	Nominal Weight kg/km
0.9mm conductor, 1.5mm Insulated Wire				
RS27220-2Y(F)(L)2YB2Y-10P0.9	10	1.8	25.8	755
RS27220-2Y(F)(L)2YB2Y-20P0.9	20	1.8	27.8	946
RS27220-2Y(F)(L)2YB2Y-30P0.9	30	2.0	31.8	1225
RS27220-2Y(F)(L)2YB2Y-50P0.9	50	2.0	35.8	1643
RS27220-2Y(F)(L)2YB2Y-75P0.9	75	2.2	41.6	2240
RS27220-2Y(F)(L)2YB2Y-100P0.9	100	2.2	46.6	2780


UV Resistant


Water Resistant

Rated Voltage


Laid In Ducts



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Outdoor Single Mode Trackside Fiber Cables NR/PS/TEL/00014

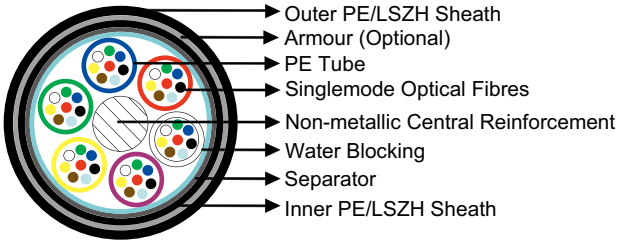
Applications

The cables are fibre communications cable designed for use in high traffic and data rate requirements.

Standards

- NR/PS/TEL/00014 (formerly RT/E/PS/00014)

Construction



- Fibre: Step Index Singlemode Fibres in accordance with ITU-T recommendation G.652.9/125 μm Fibre @ 1310nm &1550nm.
- Fibre Carrier: PE
- Central Strength Member: Single continuous non-metallic.
- Water blocking: Water blocking material.
- Separator: PET (Polyester Tape).
- Inner Sheath: PE (Polyethylene) Type 03C to BS6234 or LSZH Sheath.
- Sheath：PE (Polyethylene) Type 03C to BS6234 or LSZH sheath.

Optionally

Armoured Cables: Corrugated steel tape armoured cables can be offered as an option.

Electrical Characteristics at 20□

Maximum Attenuation		G652
@1310nm	dB/km	0.35
@1550nm	dB/km	0.22
Maximum Chromatic Dispersion		
Between 1260 and 1360nm	ps/(nm/km)	3.5
Between 1530 and 1565nm	ps/(nm/km)	19
Zero Dispersion Wavelength	nm	1310±11
Zero Dispersion Slope	ps/(nm^2.km)	0.09
Numerical Aperture		0.14
Point discontinuity	dB	0.1
PMD (individual fiber)	ps/km	0.2
Maximum Cutoff Wavelength	nm	1260

Cladding Diameter	um	125±1
Core/Cladding Concentricity Error	um	≤0.5
Cladding Non Circularity	%	≤1
Coating Non Circularity	%	≤6
Proof Test Level	Kpsi (GN/m^2)	100 (0.7)
Crush Resistance	N/cm	300
Maximum Laying Tension	N	From 12 to 72 FO: 2500;144 FO:3000

Mechanical and Thermal Properties

- Minimum Bending Radius: 12 x OD.
- Temperature Range: -20℃ to +60℃ (during operation); -10℃ to +60℃ (during installation)

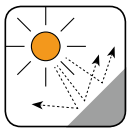
Dimensions and Weight

Unarmoured Single Mode Trackside Fiber Cables

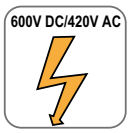
Cable Code	No. of fibres	Nominal Cladding Thickness μm	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
			Inner	Outer		
RO14-ML-B-9-2x4-F-2Y2Y	8	125	1.6	2.0	12.0	110
RO14-ML-B-9-2x6-F-2Y2Y	12	125	1.6	2.0	12.0	110
RO14-ML-B-9-4x5-F-2Y2Y	20	125	1.6	2.0	12.0	110
RO14-ML-B-9-8x6-F-2Y2Y	48	125	1.6	2.0	12.6	120
RO14-ML-B-9-16x6-F-2Y2Y	96	125	1.6	2.0	14.0	150

Steel Tape Armoured Single Mode Trackside Fiber Cables

Cable Code	No. of fibres	Nominal Cladding Thickness μm	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
			Inner	Outer		
RO14-ML-B-9-2x4-F-2Y(STA)2Y	8	125	1.6	2.0	15.0	210
RO14-ML-B-9-2x6-F-2Y(STA)2Y	12	125	1.6	2.0	15.0	210
RO14-ML-B-9-4x5-F-2Y(STA)2Y	20	125	1.6	2.0	15.0	210


UV Resistant


Water Resistant



Rated Voltage


Laid In Ducts

PE Sheath

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

LSZH Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

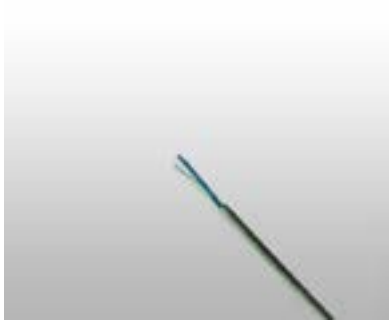

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

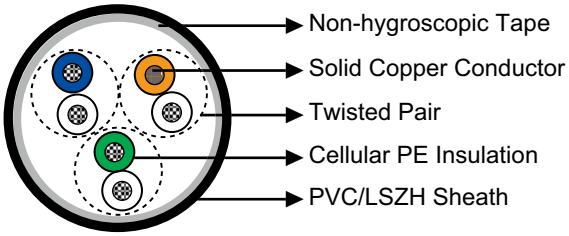
RO14-ML-B-9-8x6-F-2Y(STA)2Y	48	125	1.6	2.0	15.5	230
RO14-ML-B-9-16x6-F-2Y(STA)2Y	96	125	1.6	2.0	17.0	270

G7621 Trackside Communications Cables



Applications

The cables are designed for installation in trackside bracket runs and for use in open locations (type1) or in tunnels or underground locations (type2).



Standards

- LUL Spec G7621 A2 type 1 (for PVC sheath)
- LUL Spec G7621 A2 type 2 (for LSZH sheath)

Construction

- Conductors: Solid plain copper, 0.63/0.9 mm nominal diameter.
- Insulation: Cellular polyethylene.
- Cabling Element: Two insulated conductors are twisted together to form a pair.
- Core Wrapping: Non-hygroscopic plastic tape with overlapping.
- Outer sheath: PVC/LSZH sheath, coloured violet.

Core Identification

1 Pair Cable: Blue/White

3 Pair Cable: Blue/White Orange/White Green/White

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.63	0.9
Maximum Conductor Resistance			
Average value	Ω/km	57.5	28
Individual value	Ω/km	59	29
Minimum Insulation Resistance @500 V DC	MΩ.km	1500	1500
Maximum Average Mutual Capacitance	nF/km	59	59
Maximum Average Capacitance Unbalance			
Pair to pair	pF/460m	100	100
Pair to earth	pF/460m	1200	1200

Mechanical and Thermal Properties

- Bending Radius: 7.5xOD
- Temperature Range: -30℃ to +70℃ (during operation); -10℃ +55℃ (during installation)

Dimensions and Weight

Cable Code	No. of pairs	Nominal Thickness of Sheath mm	Nominal Overall Diameter mm	Nominal Weight kg/km
0.63mm conductor, 1.15mm Insulated Wire				
RS7621A2/T1-02YY-1P0.63	1	2.5	7.0	60
RS7621A2/T1-02YY-3P0.63	3	2.5	9.0	90
0.9mm conductor, 1.5mm Insulated Wire				
RS7621A2/T1-02YY-1P0.9	1	2.5	8.0	70
RS7621A2/T1-02YY-3P0.9	3	2.5	10.0	120


Mineral Oil Resistant

Rated voltage


Buried in Ground


Laid In Ducts

PVC Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

LSZH Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

G7622 Trackside Communications Cables

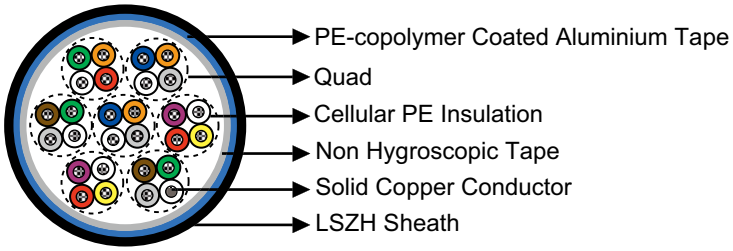
Applications

The cables are designed for installation in trackside bracket runs and for use within railway equipment rooms within open locations (type 1) or in subsurface tunnels and underground locations (type 2).

Standards

- LUL Spec G7622 A1 type 1 (for PVC sheath)
- LUL Spec G7622 A1 type 2 (for LSZH sheath)

Construction



- Conductors: Solid plain copper, 0.63/0.9 mm nominal diameter.
- Insulation: Cellular polyethylene.
- Cabling Element: Four insulated conductors are twisted together to form a quad.
- Stranding: Conductors are helically stranded in concentric layers.
- Core wrapping: Plastic tape (s) with overlapping.
- Moisture Barrier: One laminated sheath made of aluminium tape (0.15mm thick) coated with PE-Copolymer on at least one side is applied with longitudinally overlap.
- Outer sheath: LSZH sheath, coloured violet.

Optionally

Type 1 Cables: For type 1 cables, additional foil (at least one polyester tape) and PVC sheath are applied over the LSZH sheath. (VDE Code: A-02Y(L)HY)

Armoured Cables: Corrugated steel tape armour is applied with an overlap over LSZH sheath. An outer LSZH sheath is applied over the armour. (VDE Code: A-02Y(L)H(SR)H)

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.63	0.9
Maximum Conductor Resistance			
Average Value	Ω/km	57.5	28
Individual Value	Ω/km	59	29
Minimum Insulation Resistance @500 V DC	MΩ.km	1500	1500
Maximum Average Mutual Capacitance	nF/km	59	59
Maximum Average Capacitance Unbalance			
Between pairs in same quad	pF/460m	50	50
Between pairs (centre or in any layer)	pF/460m	30	30
Between any pairs and earth	pF/460m	200	200

Between phantom and pairs in same quad	pF/460m	300	300

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD (unarmoured); 10xOD (armoured)
- Temperature Range: -40℃ to +70℃ (during operation); -10℃ to +50℃ (during installation)

Core Identification

Quad colours in centre and even layers

Position of Quad in Layer	Centre and Even Layers				Quad Whipping Colours
	A Wire	B Wire	C Wire	D Wire	
1st Quad (Marker)	ORANGE	WHITE	BLUE	GREY	WHITE/ORANGE
Even Quads	RED	WHITE	VIOLET	YELLOW	WHITE
Odd Quads	BROWN	WHITE	GREEN	GREY	WHITE
Last Quad	ORANGE	WHITE	RED	GREEN	WHITE/ORANGE

Quad colours in odd layers

Position of Quad in Layer	Odd Layers				Quad Whipping Colours
	A Wire	B Wire	C Wire	D Wire	
1st Quad (Marker)	ORANGE	BLACK	BLUE	GREY	WHITE/ORANGE
Even Quads	RED	BLACK	VIOLET	YELLOW	WHITE
Odd Quads	BROWN	BLACK	GREEN	GREY	WHITE
Last Quad	ORANGE	BLACK	RED	GREEN	WHITE/ORANGE

Make-up of cable

Number of Pairs	Number of Quads in centre and successive layers						
	Centre	1st Layer	2ndLayer	3th Layer	4th Layer	5th Layer	6th Layer
8	4	-	-	-	-	-	-
14	1	6	-	-	-	-	-
20	2	8	-	-	-	-	-
28	4	10	-	-	-	-	-
38	1	6	12	-	-	-	-
54	3	9	15	-	-	-	-
74	1	6	12	18	-	-	-
104	4	10	16	22	-	-	-
160	4	10	16	22	28	-	-
228	4	10	16	22	28	34	-
308	4	10	16	22	28	34	40

Dimensions and Weight

G7622 A1 Type 2 Cables

Cable Code	No. of pairs	Minimum Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
0.63mm conductor, 1.0mm Insulated Wire				
RS7622A1/T2-02Y(L)H-8P0.63	8	2.5	14.5	190
RS7622A1/T2-02Y(L)H-14P0.63	14	2.5	16.0	240
RS7622A1/T2-02Y(L)H-20P0.63	20	2.5	17.5	310
RS7622A1/T2-02Y(L)H-28P0.63	28	2.5	19.5	380
RS7622A1/T2-02Y(L)H-38P0.63	38	2.5	21.5	470
RS7622A1/T2-02Y(L)H-54P0.63	54	2.5	23.5	610
RS7622A1/T2-02Y(L)H-74P0.63	74	2.5	25.5	780
RS7622A1/T2-02Y(L)H-104P0.63	104	2.5	29.0	1020
RS7622A1/T2-02Y(L)H-160P0.63	160	2.5	34.0	1498
RS7622A1/T2-02Y(L)H-228P0.63	228	2.5	39.0	1993
RS7622A1/T2-02Y(L)H-308P0.63	308	2.5	43.5	2670
0.9mm conductor, 1.5mm Insulated Wire				

Cable Code	No. of pairs	Minimum Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RS7622A1/T2-02Y(L)H-8P0.9	8	2.5	17.5	280
RS7622A1/T2-02Y(L)H-14P0.9	14	2.5	20.0	380
RS7622A1/T2-02Y(L)H-20P0.9	20	2.5	22.5	500
RS7622A1/T2-02Y(L)H-28P0.9	28	2.5	24.5	630
RS7622A1/T2-02Y(L)H-38P0.9	38	2.5	25.5	790
RS7622A1/T2-02Y(L)H-54P0.9	54	2.5	29.0	1060
RS7622A1/T2-02Y(L)H-74P0.9	74	2.5	32.5	1370
RS7622A1/T2-02Y(L)H-108P0.9	108	2.5	37.5	1830

G7622 A1 Type 1 Cables

Cable Code	No. of pairs	Minimum Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.63mm conductor, 1.0mm Insulated Wire					
RS7622A1/T1-02Y(L)HY-8P0.63	8	2.5	3.0	20.5	330
RS7622A1/T1-02Y(L)HY-14P0.63	14	2.5	3.0	22.0	390
RS7622A1/T1-02Y(L)HY-20P0.63	20	2.5	3.0	23.5	480
RS7622A1/T1-02Y(L)HY-28P0.63	28	2.5	3.0	25.5	560
RS7622A1/T1-02Y(L)HY-38P0.63	38	2.5	3.0	27.5	660
RS7622A1/T1-02Y(L)HY-54P0.63	54	2.5	3.0	29.5	830
RS7622A1/T1-02Y(L)HY-74P0.63	74	2.5	3.0	31.5	1010
RS7622A1/T1-02Y(L)HY-104P0.63	104	2.5	3.0	35.0	1290
0.9mm conductor, 1.5mm Insulated Wire					
RS7622A1/T1-02Y(L)HY-8P0.9	8	2.5	3.0	23.5	440
RS7622A1/T1-02Y(L)HY-14P0.9	14	2.5	3.0	26.0	550
RS7622A1/T1-02Y(L)HY-20P0.9	20	2.5	3.0	28.5	700
RS7622A1/T1-02Y(L)HY-28P0.9	28	2.5	3.0	30.5	840
RS7622A1/T1-02Y(L)HY-38P0.9	38	2.5	3.0	31.5	1020
RS7622A1/T1-02Y(L)HY-54P0.9	54	2.5	3.0	35.0	1310
RS7622A1/T1-02Y(L)HY-74P0.9	74	2.5	3.0	38.5	1650
RS7622A1/T1-02Y(L)HY-104P0.9	104	2.5	3.0	43.5	2160

Armoured G7622 A1 Type 2 Cables

Cable Code	No. of pairs	Minimum Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.63mm conductor, 1.0mm Insulated Wire					
RS7622A1/T2-02Y(L)H(SR)H-8P0.63	8	1.2	2.5	18.2	430
RS7622A1/T2-02Y(L)H(SR)H-14P0.63	14	1.2	2.5	19.0	500
RS7622A1/T2-02Y(L)H(SR)H-20P0.63	20	1.2	2.5	21.2	600
RS7622A1/T2-02Y(L)H(SR)H-28P0.63	28	1.2	2.5	22.6	690
RS7622A1/T2-02Y(L)H(SR)H-38P0.63	38	1.2	2.5	24.2	810
RS7622A1/T2-02Y(L)H(SR)H-54P0.63	54	1.2	2.5	26.7	980
RS7622A1/T2-02Y(L)H(SR)H-74P0.63	74	1.2	2.5	29.2	1190
RS7622A1/T2-02Y(L)H(SR)H-104P0.63	104	1.2	2.5	32.6	1480


Mineral Oil Resistant

Rated voltage


Buried in Ground


Laid In Ducts

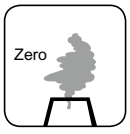
PVC Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

LSZH Sheath


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

G7623 Trackside Communications Cables

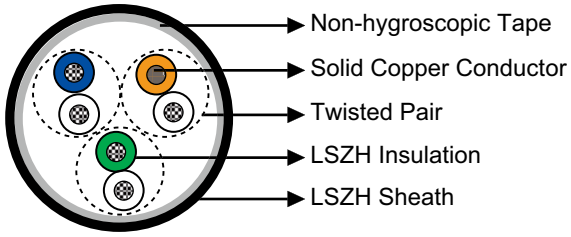
Applications

The cables are designed for limited fire hazard applications for internal use within stations, buildings and equipment rooms.

Standards

- LUL Spec G7623 A2

Construction



- Conductors: Tinned annealed solid copper, 0.5/0.6/0.63 mm nominal diameter.
- Insulation: LSZH Insulation.
- Cabling Element: Two insulated conductors are twisted together to form a pair.
- Stranding: Cables are composed of unit stranding.
- Core wrapping: Non-hygroscopic plastic tape with overlapping.
- Outer sheath: LSZH sheath.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.5	0.6	0.63
Maximum Conductor Resistance	Ω/km	98	68	58
Minimum Insulation Resistance @500 V DC	MΩ.km	120	120	120
Maximum Average Mutual Capacitance @1KHz	nF/km	80	80	80
Maximum Average Capacitance Unbalance @800Hz pair-to-pair		500	500	500
Test Voltage AC 1min	V	500	500	500

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD
- Temperature Range: -30℃ to +70℃ (during operation); -10℃ +55℃ (during installation)

Core Identification

Colour scheme, unit binder colour and cable make-up according to G7623

Pair Number	A Wire	B Wire	Pair Size	20 Pair	40 Pair	80 Pair	100 Pair	160 Pair	320 Pair
				Number of Units					
			Center	1	2	1	3x1/2	2	1
			1st Layer			6x1/2*	7x1/2	6	5
			2nd Layer						10
1	WHITE	BLUE	1	ORANGE	ORANGE	ORANGE	BLUE	ORANGE	ORANGE
2	WHITE	ORANGE	2		GREEN	ORANGE	ORANGE	GREEN	ORANGE
3	WHITE	GREEN	3			NATURAL	GREEN	ORANGE	NATURAL
4	WHITE	BROWN	4			GREEN	BROWN	NATURAL	NATURAL
5	WHITE	GREY	5				GREY	NATURAL	NATURAL
6	RED	BLUE	6				WHITE	NATURAL	GREEN
7	RED	ORANGE	7				RED	NATURAL	ORANGE
8	RED	GREEN	8				BLACK	GREEN	NATURAL

9	RED	BROWN	9				YELLOW		NATURAL
10	RED	GREY	10				VIOLET		NATURAL
11	BLACK	BLUE	11						NATURAL
12	BLACK	ORANGE	12						NATURAL
13	BLACK	GREEN	13						NATURAL
14	BLACK	BROWN	14						NATURAL
15	BLACK	GREY	15						NATURAL
16	YELLOW	BLUE	16						GREEN
17	YELLOW	ORANGE							
18	YELLOW	GREEN							
19	YELLOW	BROWN							
20	YELLOW	GREY							

*1/2 refers to units of 10 Pairs

Dimensions and Weight

Cable Code	No. of pairs	Minimum Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
0.5mm Conductor, 0.82mm Insulated Wire				
RS7623A2-HH-1P0.5	1	1.3	6.0	30
RS7623A2-HH-2P0.5	2	1.3	7.0	45
RS7623A2-HH-3P0.5	3	1.4	7.0	50
RS7623A2-HH-6P0.5	6	1.5	9.0	61
RS7623A2-HH-10P0.5	10	1.6	11.0	107
RS7623A2-HH-20P0.5	20	1.9	14.0	190
RS7623A2-HH-40P0.5	40	1.9	16.0	320
RS7623A2-HH-80P0.5	80	2.2	23.0	640
RS7623A2-HH-100P0.5	100	2.2	25.0	760
RS7623A2-HH-160P0.5	160	2.6	29.0	1150
0.6mm Conductor, 1.12mm Insulated Wire				
RS7623A2-HH-1P0.6	1	1.4	6.0	35
RS7623A2-HH-2P0.6	2	1.4	7.0	50
RS7623A2-HH-3P0.6	3	1.5	7.0	60
RS7623A2-HH-6P0.6	6	1.6	9.0	85
RS7623A2-HH-10P0.6	10	1.7	11.0	145
RS7623A2-HH-20P0.6	20	2.2	14.0	245
RS7623A2-HH-40P0.6	40	2.2	18.0	410
RS7623A2-HH-80P0.6	80	2.8	25.0	830
RS7623A2-HH-100P0.6	100	2.8	27.0	980
RS7623A2-HH-160P0.6	160	3.2	33.0	1450
0.63mm Conductor, 1.15mm Insulated Wire				
RS7623A2-HH-1P0.63	1	1.4	5.5	40
RS7623A2-HH-3P0.63	3	1.5	7.3	70
RS7623A2-HH-5P0.63	5	1.6	8.5	89
RS7623A2-HH-6P0.63	6	1.6	8.9	100
RS7623A2-HH-10P0.63	10	1.7	11.1	170
RS7623A2-HH-12P0.63	12	1.7	11.6	195
RS7623A2-HH-160P0.63	160	3.2	35.0	1595


Mineral Oil Resistant

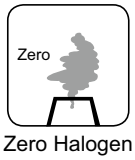
Rated voltage


Buried in Ground


Laid In Ducts


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

MD4 Medium Distance Trackside Telecom Cables

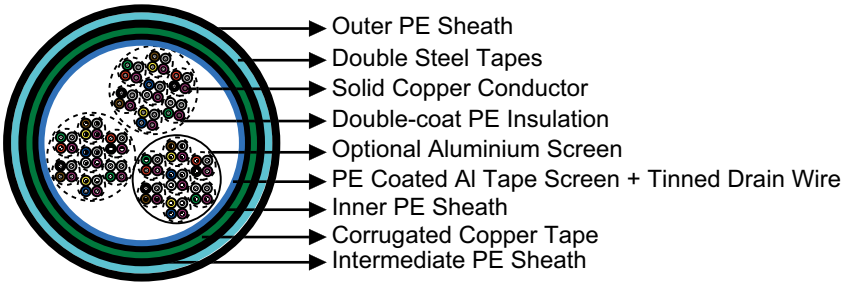
Applications

The cables are designed for long distance of over 10km telecommunications alongside railway lines.

Standards

- SNCF CT 2328 (Main cables) /SNCT CT 2329 (Branch cables)

Construction



CT2328 Type (Main Cables)

- Conductors：Solid copper, 0.8mm nominal diameter
- Insulation：Coloured solid polyethylene.
- Cabling Element：Four conductors are twisted
- together to form a quad.
- Possible Harness: Aluminium screen.
- Filling：Petroleum jelly.
- Screen: PE-copolymer coated aluminium tape
- Drain Wire: Tinned drain wire.
- Inner Sheath：Low density polyethylene
- Screen：One corrugated copper tape
- Intermediate Sheath：Low density polyethylene
- Armour：Two helically applied steel tapes.
- Outer Sheath：Low density polyethylene

Optionally

CT2329 Type (Branch Cables): For CT 2329 type, the cables have PE inner sheath, double corrugated steel tapes armour and PE outer sheath, without aluminium tape screen & copper tape.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.8
Maximum Conductor Resistance (DC)	Ω/km	73.4
Minimum Insulation Resistance @500 V DC (3mins)	MΩ.km	15000
Mutual Capacitance @800Hz	nF/km	51
Average Capacitance Unbalance		
Main Cables		
In quad	pF/1450 m	50

Between quads	pF/1450 m	30
Real-ground	pF/1450 m	200
Branch Cables		
In quad	pF/1450 m	100
Between quads	pF/1450 m	100
Real-ground	pF/1450 m	700
Maximum Attenuation @1MHz	dB/km	15.9
Maximum Reduction Factor for Main Cables		
14 quads		0.3
21 quads		0.2
28 quads		0.18
Dielectric Strength (DC voltage 1min)		
Conductor to conductor	V	1500
Conductor to screen	V	3000

Mechanical and Thermal Properties

- Bending Radius: 10XOD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

CT2328 (Main cable)

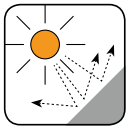
Cable Code	No. of Quads	Nominal Sheath Thickness mm			Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Interm.	Outer		
0.8mm conductor, 1.27mm Insulated Wire						
RS2328-2Y2Y(K)2YB2Y-14Q0.8	14	1.2	1.1	2.2	29.2	1332
RS2328-2Y2Y(K)2YB2Y-21Q0.8	21	1.3	1.3	2.5	31.3	1655
RS2328-2Y2Y(K)2YB2Y-28Q0.8	28	1.3	1.3	2.5	35.5	2013

CT2328 (Main cables with screened quads)

Cable Code	No. of Quads	Nominal Sheath Thickness mm			Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Interm.	Outer		
0.8mm conductor, 1.27mm Insulated Wire						
RS2328-2Y2Y(K)2YB2Y-(14+7)Q0.8	14+7screen Quads	1.3	1.3	2.5	32.7	1765
RS2328-2Y2Y(K)2YB2Y-(18+3)Q0.8	18+3screen Quads	1.3	1.3	2.5	32.9	1783

CT2329 (Branch cable)

Cable Code	No. of Quads	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.8mm conductor, 1.4mm Insulated Wire					
RS2329-2Y2YB2Y-4Q0.8	4	1.0	1.7	16.4	339
RS2329-2Y2YB2Y-8Q0.8	8	1.2	1.8	18.8	477
RS2329-2Y2YB2Y-14Q0.8	14	1.2	2.2	22.3	686

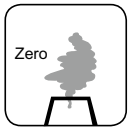

UV Resistant


Water Resistant

Rated voltage


Laid in Channe


Buried in Ground



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

ST2513/CT2243 Outdoor Single Mode Unarmoured Trackside Optical Fiber Cables

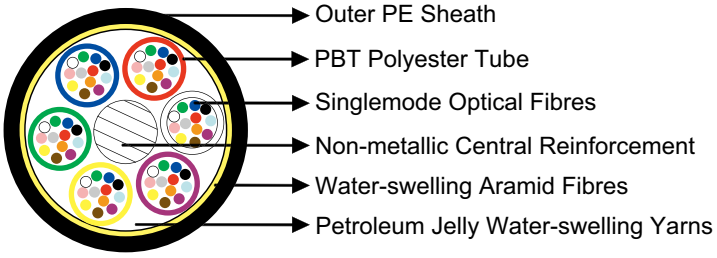
Applications

The cables are designed for long distance telecom links on optical fibres along railway tracks. The cables are suitable for pulled through ducts or laid in channels.

Standards

- SNCF ST 2513-99

Construction



- Fibres: Singlemode optical fibres G652 coloured (6 or 12 per tube)
- Tube: PBT polyester tubes From 12 to 72 OFs: 1 to 6 tubes; 144 OFs: 12 tubes.
- Central Strength Member: Non-metallic central reinforcement (FRP).
- Filling: Petroleum jelly + water-swelling yarns.
- Reinforcement: Water-swelling aramid fibres.
- Sheath：PE sheath.

Electrical Characteristics at 20□

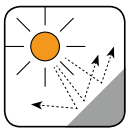
Maximum Attenuation		G652
@1310nm	dB/km	0.35
@1550nm	dB/km	0.22
Maximum Chromatic Dispersion		
Between 1260 and 1360nm	ps/(nm/km)	3.5
Between 1530 and 1565nm	ps/(nm/km)	19
Zero Dispersion Wavelength	nm	1310±11
Zero Dispersion Slope	ps/(nm^2.km)	0.09
Numerical Aperture		0.14
Point discontinuity	dB	0.1
PMD (individual fiber)	ps/km	0.2
Maximum Cutoff Wavelength	nm	1260
Cladding Diameter	um	125±1
Core/Cladding Concentricity Error	um	≤0.5
Cladding Non Circularity	%	≤1
Coating Non Circularity	%	≤6
Proof Test Level	Kpsi (GN/m^2)	100 (0.7)
Crush Resistance	N/cm	300
Maximum Laying Tension	N	From 12 to 72 FO: 2500;144 FO:3000

Mechanical and Thermal Properties

- Minimum Bending Radius: from 12 to 72 FO: 230mm; 144 FO: 340mm.
- Temperature Range: -30℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

Cable Code	No. of fibres	No of Tubes x No of Fibers/Tube	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
ROB3-ML-B-9-1x12-F-2Y	12	1 tubes of 12 OF	1.5	11.6	112
ROB3-ML-B-9-3x12-F-2Y	36	3 tubes of 12 OF	1.5	11.6	112
ROB3-ML-B-9-6x6-F-2Y	36	6 tubes of 6 OF	1.5	11.6	112
ROB3-ML-B-9-6x12-F-2Y	72	6 tubes of 12 OF	1.5	11.6	112
ROB3-ML-B-9-12x12-F-2Y	144	12 tubes of 12 OF	1.5	17.0	225


UV Resistant


Water Resistant


Laid In Ducts


Laid in Channel

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

CT2242 Outdoor Single Mode Armoured Trackside Optical Fiber Cables

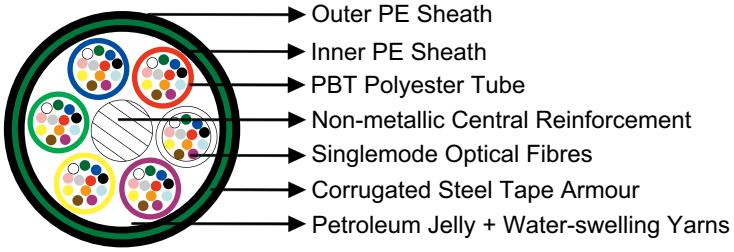
Applications

The cables are designed for long distance telecom links on optical fibres along railway tracks. The cables are suitable for installation directly in channels or buried.

Standards

- SNCF CT 2242.6.1

Construction



- Fibres: Singlemode optical fibres G652 coloured (6 or 12 per tube)
- Central Strength Member: Non-metallic central reinforcement (FRP).
- Tube: PBT polyester tubes containing fibres
- Filling: Petroleum jelly with water-swelling yarns to provide longitudinal watertightness
- Inner Sheath: Low density polyethylene
- Armour: 0.25mm thick corrugated steel tape armour.
- Outer Sheath：Low density polyethylene

Electrical Characteristics at 20□

Maximum Attenuation		G652
@1310nm	dB/km	0.35
@1550nm	dB/km	0.22
Maximum Chromatic Dispersion		
Between 1260 and 1360nm	ps/(nm/km)	3.5
Between 1530 and 1565nm	ps/(nm/km)	19
Zero Dispersion Wavelength	nm	1310±11
Zero Dispersion Slope	ps/(nm^2.km)	0.09
Numerical Aperture		0.14
Point discontinuity	dB	0.1
PMD (individual fiber)	ps/km	0.2
Maximum Cutoff Wavelength	nm	1260
Cladding Diameter	um	125±1
Core/Cladding Concentricity Error	um	≤0.5
Cladding Non Circularity	%	≤1
Coating Non Circularity	%	≤6
Proof Test Level	Kpsi (GN/m^2)	100 (0.7)
Crush Resistance	N/cm	450
Maximum Laying Tension	N	3000

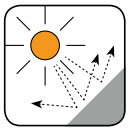
Mechanical and Thermal Properties

- Minimum Bending Radius: 310mm.
- Temperature Range: -40℃ to +70℃ (during operation); -10℃ +70℃ (during installation)

Dimensions and Weight

Cable Code	No. of fibres	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RO2242-ML-C-9-TnxFn-SR-2Y(STA)2Y	1-36	1.5	14.5	260
RO2242-ML-C-9-TnxFn-SR-2Y(STA)2Y	48-72	1.5	16.5	300
RO2242-ML-C-9-TnxFn-SR-2Y(STA)2Y	80-144	1.5	22.0	510

Tn: Number of tubes; Fn: Number of fibers in a tube


UV Resistant


Water Resistant


Laid in Channel


Buried in Ground

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

K20 & L120 LSZH Armoured F/FTP Cat6 Cables

Applications

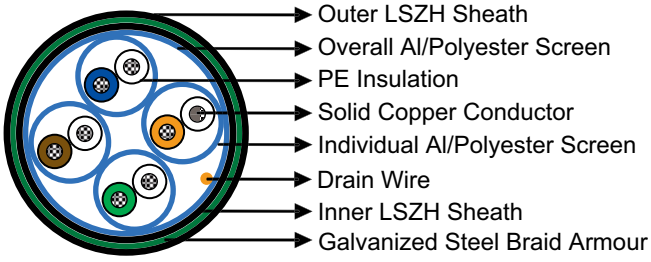
The cables are designed for high speed data transmissions, and are suitable for installations in cable trays or on hooks.

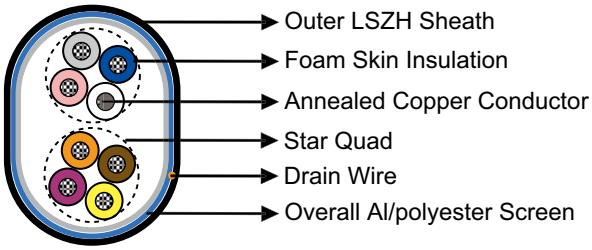
Standards

- RATP CAT6-K20 (for K20 cable)
- FRANCE TELECOM S31-10/20 & NF C 93.531-6/7 (for L120 cable)

Construction

- Conductors: Class 1 AWG23 solid copper conductor (for K20 cable); 0.6mm annealed copper conductor (for L120 cable).
- Insulation: Solid polyethylene (for K20 cable); Foam skin (cellular PE + solid PE) (for L120 cable).
- Cabling Element：Two conductors are twisted together to form a pair (for K20 cable); Four conductors are twisted together to form a quad (for L120 cable).
- Core Wrapping (for L120 cable): Non-hygroscopic plastic tape with overlapping.
- Individual Screen (for K20 cable): Alu/polyester shield on each pair.
- Overall Screen: Alu/polyester shield
- Drain Wire: Tinned copper drain wire, 0.5mm nominal diameter.
- Inner Sheath (for K20 cable)：LSZH.
- Armour (for K20 cable)：Galvanized steel braid armour.
- Outer Sheath：LSZH.





Optionally

Armoured L120 Cables: Tinned copper braid armoured cables can be offered upon request.

Electrical Characteristics at 20□

Nominal Conductor Diameter	mm	0.56 (K20)	0.6 (L120)
AWG		23	23
Maximum Conductor Resistance	Ω/km	146.4	133.2
Minimum Insulation Resistance @500 V DC	MΩ/km	5000	5000
Characteristics Impedance @100MHz	Ω	100	120+15
Maximum Capacitance Unbalance			
Real/earth	pF/km	1600	300
Maximum Average Attenuation			
@1MHz	dB/100m	2.0	2.0
@4MHz	dB/100m	3.8	3.8
@10MHz	dB/100m	6.0	6.0
@16MHz	dB/100m	7.6	7.6
@25MHz	dB/100m	9.5	9.5
@31.25MHz	dB/100m	10.7	10.7
@62.5MHz	dB/100m	15.4	15.4
@100MHz	dB/100m	19.8	19.8

@250MHz	dB/100m	32.9	32.9
Minimum NEXT Pair to Pair			
@1MHz	dB	77.3	77.3
@4MHz	dB	68.3	68.3
@10MHz	dB	62.3	62.3
@16MHz	dB	59.2	59.2
@25MHz	dB	56.3	56.3
@31.25MHz	dB	54.9	54.9
@62.5MHz	dB	50.4	50.4
@100MHz	dB	47.3	47.3
@250MHz	dB	41.3	41.3
Minimum ELFEXT Pair to Pair			
@1MHz	dB	68.8	68.8
@4MHz	dB	56.8	56.8
@10MHz	dB	48.8	48.8
@16MHz	dB	44.7	44.7
@25MHz	dB	40.8	40.8
@31.25MHz	dB	38.9	38.9
@62.5MHz	dB	32.8	32.8
@100MHz	dB	28.8	28.8
@250MHz	dB	20.8	20.8

Mechanical and Thermal Properties

- Minimum Bending Radius: 12XOD (static); 24XOD (dynamic)
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

K20 cables

Cable Code	No. of pairs	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
		Inner	Outer		
0.56mm conductor, 1.45mm Insulated Wire					
RD/K20-F/FTPCat6-2Y(St)H(SWB)H-PIMF-4P0.56	4	1.0	1.0	11.7	156

L120 cables

Cable Code	No. of pairs	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
0.6mm conductor, 1.34mm Insulated Wire				
RD/L120-F/FTPCat6-02YHH-4P0.6	4(2Q)	1.8	8.5 x 6*	60
RD/L120-F/FTPCat6-02YHH-8P0.6	8(2 x 4p)	1.8	18 x 6**	120
RD/L120-F/FTPCat6-02YHH-12P0.6	12(3 x 4p)	1.8	16	235
RD/L120-F/FTPCat6-02YHH-32P0.6	32(4 x 4Q)	1.8	19	360
RD/L120-F/FTPCat6-02YHH-64P0.6	64(8 x 4Q)	1.8	30	675
RD/L120-F/FTPCat6-02YHH-128P0.6	128(4SU x 4Q)	1.8	40	1250

SU=super unit. * For 4 pair L120 cable, 8 insulated wires form 2 quads and the cable is flat.
** For 8 pair L120 cable, two flat quads are assembled under a common LSH sheath.


Impact Resistant

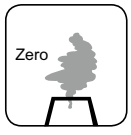

Mineral Oil Resistant


Acid&Alkaline Resistant


Laid in Cable Trays/on Hooks


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

K209B LSZH Armoured Optical Fiber Cables

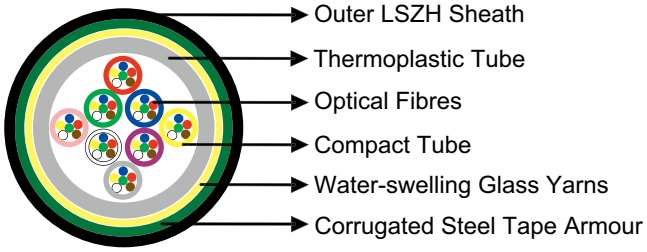
Applications

The cables are designed for long distance telecommunication and using optical fibres in urban railways infrastructure. These low smoke halogen-free cables are laid on hooks, pulled through ducts or cable trays.

Standards

- RATP K209B or RATP K209A

Construction



- Compact Tube: 6 or 12 singlemode optical fibres G652 or multimode fibers assembled under thermoplastic "peelable" skin. Tube diameter: 1mm.
- Filling: Water-swelling yarns.
- Tube: Thermoplastic
- Peripheral Strength Member: Water-swelling glass yarns.
- Armour : Corrugated steel tape armour 25/100.
- Sheath : LSZH

Optionally

K209A Type : For K209A type, the cables have loose tubes with 6-12 fibers, steel wire strand as central strength member, glass yarn reinforced, incorporating a corrugated steel tape armour and an outer UV stabilized LSZH jacket.

Electrical Characteristics at 20□

Optical & Geometrical Properties for Single Mode Fibers

Maximum Attenuation		G652
@1310nm	dB/km	0.35
@1550nm	dB/km	0.22
Maximum Chromatic Dispersion		
Between 1260 and 1360nm	ps/(nm/km)	3.5
Between 1530 and 1565nm	ps/(nm/km)	19
Zero Dispersion Wavelength	nm	1310±11
Zero Dispersion Slope	ps/(nm^2.km)	0.09
Numerical Aperture		0.14
Point discontinuity	dB	0.1
PMD (individual fiber)	ps/km	0.2
Maximum Cutoff Wavelength	nm	1260
Cladding Diameter	um	125±1
Core/Cladding Concentricity Error	um	≤0.5
Cladding Non Circularity	%	≤1
Coating Non Circularity	%	≤6
Proof Test Level	Kpsi (GN/m^2)	100 (0.7)
Crush Resistance	N/cm	300
Maximum Laying Tension	N	3000

Optical & Geometrical Properties for Multimode Fibers

		50/125	62.5/125
Maximum Attenuation			
@850nm	dB/km	≤2.5	≤3.0
@1300nm	dB/km	≤0.7	≤0.8
Maximum Chromatic Dispersion			
@850nm	MHz*km	≥500	≥200
@1300nm	MHz*km	≥800	≥500
Zero Dispersion Wavelength	nm		1310
Numerical Aperture	-	0.20±0.015	0.275±0.015
Core Diameter	um	50±3	62.5±3
Cladding Diameter	um	125±2	125±2
Core/Cladding Concentricity Error(Offset)	um	≤1.5	≤1.5
Coating-Clad Concentricity Error(Offset)	um	≤8	≤8
Core Non-Circularity	%	≤6	≤6
Cladding Non-Circularity	%	≤2 1	≤2 1
Coating Diameter	um	245±10	245±10
Proof-Test Level	Kpsi (GN/m^2)	100 (0.7)	100 (0.7)

Mechanical and Thermal Properties

- Bending Radius: 20 x OD
- Temperature Range: -40℃ to +60℃ (during operation); -10℃ +60℃ (during installation)

Dimensions and Weight

K209A

Cable Code	No. of fibres	Distribution	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RO/K209A-ML-C-9-TnxFn-SR-(STA)H	1-36	6 fibre per tubes	1.8	12	190
RO/K209A-ML-C-9-TnxFn-SR-(STA)H	42-72	6/12 fibre per tubes	1.8	13.5	230

Tn: Number of tubes; Fn: Number of fibers in a tube

K209B

Cable Code	No. of fibres	No of Tubes x No of Fibers/Tube	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
Singlemode Fibres From 6 to 36 OF – G652					
RO/K209B-ML-C-9-2x6-SR-(STA)H	12	2 tubes of 6 OF	1.8	13	112
RO/K209B-ML-C-9-4x6-SR-(STA)H	24	4 tubes of 6 OF	1.8	13	112
RO/K209B-ML-C-9-6x6-SR-(STA)H	36	6 tubes of 6 OF	1.8	13	112
Singlemode Fibres From 48 to 72 OF – G652					
RO/K209B-ML-C-9-8x6-SR-(STA)H	48	8 tubes of 6 OF	2.5	15.5	230
RO/K209B-ML-C-9-6x12-SR-(STA)H	72	6 tubes of 12 OF	2.8	15.5	230
Multimode Fibres From 6 to 36 OF – 50/125					
RO/K209B-ML-C-9-1x6-SR-(STA)H	6	1 tubes of 6 OF	1.8	13	112
RO/K209B-ML-C-9-2x6-SR-(STA)H	12	2 tubes of 6 OF	1.8	13	112


Impact Resistant

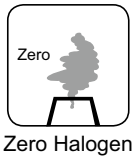

Mineral Oil Resistant


Acid&Alkaline Resistant


Laid in Cable Trays/on Hooks


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

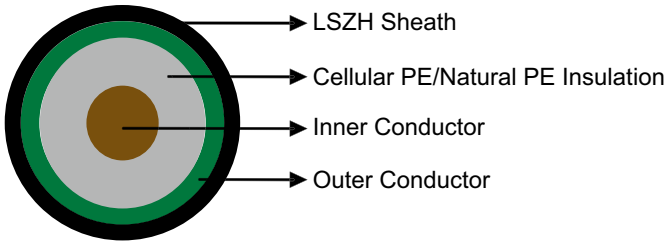
K26 LSZH 50/75 Ohm Coaxial Cables

Applications

The 50 Ohm cables are HF transmission coaxial cables for GSM antennas, and the 75 Ohm cables are HF transmission coaxial cables for cameras (type KX6), and video surveillance (type 11 RTC). The Halogen-free cables are suitable for laid on hooks, and pulled through walls or through technical ducts.

Standards

- RATP K26
- Fire Performance: NF C 32070.2.2



Construction

- Inner Conductors:
  - 50 Ohm cables:
    - Flexible Type (F)- solid copper coated aluminium (for 1/4″ , 3/8″ &1/2″ F conductor); red copper tube (for 7/8″ and 1' 1/4 F conductor); corrugated red copper tube (for 1'5/8 F conductor).
    - Super Flexible Type (SF) - solid copper coated aluminium (for 3/8″ & 1/2″ SFconductor); helical corrugated copper tube (for 7/8″ SF conductor); copper wire (for 1/4″ SFconductor)
    - Extra Flexible (XF) – copper wire (for 1/4" XF conductor); solid copper coated aluminium (for 3/8" XF conductor)
  - 75 Ohm cables: solid red copper (for type 11 RTC) or red copper tube (for type KX6).
- Dielectric: Cellular PE or natural PE (only for KX6 type)
- Outer Conductor:
  - 50 Ohm cables: corrugated copper tube
  - 75Ohm cables: copper braid.
- Outer sheath: LSZH

Electrical Characteristics at 20□

50Ohm Cables

Type of Cable	inch	1/4"F	3/8"F	1/2"F	7/8"F	1'1/4F	1'5/8F
Impedance	Ω	50	50	50	50	50	50
Attenuation							
@10MHz	dB/100m	1.25	1.46	0.65	0.34	0.25	0.2
@150MHz	dB/100m	4.99	4.22	2.61	1.45	1.02	0.85
@200MHz	dB/100m	5.8	4.90	3.04	1.69	1.19	1.00
@450MHz	dB/100m	8.8	7.51	4.66	2.61	1.86	1.57
@900MHz	dB/100m	12.8	11.1	6.78	3.81	2.75	2.34
@1000MHz	dB/100m	13.5	11.6	7.18	4.04	2.93	2.49

@1500MHz	dB/100m	17.0	14.4	8.99	5.08	3.72	3.17
@1700MHz	dB/100m	18.3	15.5	9.64	5.45	4.01	3.42
Average Power Rating							
@10MHz	KW	5.79	7.23	13	28.0	41	57
@150MHz	KW	1.45	1.81	3.2	7.0	11	13
@200MHz	KW	1.25	1.56	2.75	6.0	9.0	11
@450MHz	KW	0.818	1.02	1.8	3.88	5.5	6.9
@900MHz	KW	0.566	0.70	1.25	2.65	3.83	4.49
@1000MHz	KW	0.533	0.663	1.18	2.50	3.60	4.20
@1500MHz	KW	0.426	0.53	0.947	1.99	2.82	3.22
@1700MHz	KW	0.398	0.494	0.884	1.85	2.61	2.96
Velocity of Propagation	%	85	88	88	88	88	88

Type of Cable	inch	1/4"SF	3/8"SF	1/2"SF	7/8"SF	3/8"XF	1/4"XF
Impedance	Ω	50	50	50	50	50	50
Attenuation							
@10MHz	dB/100m	1.71	1.3	0.83	0.39	1.098	2.31
@150MHz	dB/100m	6.89	4.89	3.87	1.59	4.38	7.44
@200MHz	dB/100m	8.01	5.59	4.53	1.85	5.098	8.54
@450MHz	dB/100m	12.31	8.49	7.09	2.85	7.83	14.3
@900MHz	dB/100m	17.92	12.66	10.45	4.15	11.4	20.5
@1000MHz	dB/100m	18.98	13.5	11.09	4.4	12.1	21.83
@1500MHz	dB/100m	23.78	17.43	13.98	5.52	15.1	27.13
@1700MHz	dB/100m	25.51	18.91	15.03	5.92	16.2	29.5
Average Power Rating							
@10MHz	KW	2.8	6.0	8.4	21.5	7.02	3.8
@150MHz	KW	0.7	1.52	2.1	5.4	1.76	0.9
@200MHz	KW	0.6	1.31	1.81	4.6	1.51	0.8
@450MHz	KW	0.39	0.86	1.18	3.0	0.99	0.51
@900MHz	KW	0.272	0.593	0.815	2.07	0.68	0.37
@1000MHz	KW	0.257	0.56	0.77	1.95	0.64	0.34
@1500MHz	KW	0.206	0.449	0.616	1.55	0.51	0.26
@1700MHz	KW	0.192	0.42	0.575	1.45	0.48	0.24
Velocity of Propagation	%	83	81	82	88	85	84

75Ohm Cables

Type of Cable	inch	11 RTC	KX6
Impedance	Ω	75	75
@50MHz	dB/100m	2.5	8.13
@100MHz	dB/100m	3.6	11.73
@150MHz	dB/100m	4.6	14.53
@200MHz	dB/100m	5.4	16.92
@500MHz	dB/100m	8.5	27.0
@800MHz	dB/100m	10.5	35.1
@1000MHz	dB/100m	12.2	40.02
Velocity of Propagation	%	87	66

↘ Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD
- Temperature Range: 50 ohm cables:-40℃ to +85℃ (during operation); -20℃ to +60℃ (during installation);
  75 ohm cables: -20℃ to +85℃ (during operation); -10℃ to +60℃ (during installation)

↘ Dimensions and Weight

50Ohm Cables

Cable Code	Nominal Inner Conductor Diameter mm	Nominal Outer Conductor Diameter mm	Nominal Overall Diameter mm	Nominal Weight kg/km
1/4″ F Cable Type				
RS/K26-F-HCAAYZ-50-6(1/4")	2.5	7.6	9.5	145
3/8″ F Cable Type				
RS/K26-F-HCAAYZ-50-8(3/8")	3.3	9.5	11.5	204
1/2″ F Cable Type				
RS/K26-F-HCAAYZ-50-12(1/2")	4.8	13.7	16.0	248
7/8″ F Cable Type				
RS/K26-F-HCTAYZ-50-22(7/8")	9.0	24.8	27.75	575
1″1/4 F Cable Type				
RS/K26-F-HCTAYZ-50-32(1'1/4)	13.0	35.7	39.5	1133
1″5/8 F Cable Type				
RS/K26-F-HHTAYZ-50-42(1'5/8)	17.3	46.2	50.0	1631
1/4″ SF Cable Type				
RS/K26-HRYZ-50-5(1/4" SF)	1.9	6.4	7.95	99
3/8″ SF Cable Type				
RS/K26-HRCAYZ-50-7(3/8" SF)	2.8	9.6	11.15	159
1/2″ SF Cable Type				
RS/K26-HRCAYZ-50-9(1/2" SF)	3.6	12.1	13.65	201
7/8″ SF Cable Type				
RS/K26-HRCTYZ-50-22(7/8" SF)	9.4	25.0	27.5	550
1/4″ XF Cable Type				
RS/K26-HRYZ-50-5(1/4" XF)	5.75	5.6	6.85	69
3/8″ XF Cable Type				
RS/K26-HRCAYZ-50-7(3/8" XF)	2.76	8.0	10.1	111

*F = flexible, SF = super flexible, XF = extraflexible

75Ohm Cables

Cable Code	Nominal Inner Conductor Diameter mm	Nominal Outer Conductor Diameter mm	Nominal Overall Diameter mm	Nominal Weight kg/km
11 RTC Cable Type				
RS/K26-11RTC-BC80-H	1.7	7.85	10.3	115
KX6 Cable Type				
RS/K26-KX6-BC80-H	0.6	4.85	7.2	66


Impact Resistant

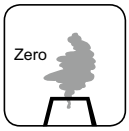

Mineral Oil Resistant


Acid&Alkaline Resistant


Laid in Ducts /on Hooks


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

RAILWAY POWER & CONTROL CABLES

France Railway Standard
UK Network Rail Standard

K25 Track Feeder Cables to NF F 55-625

Applications

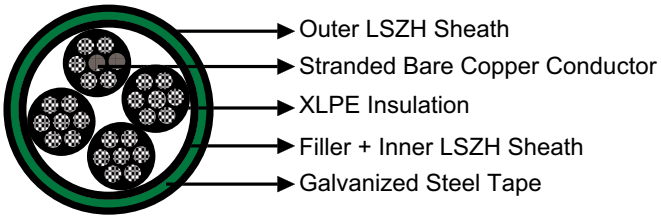
The cables are designed for fixed power or lighting installations in rail transport.

Standards

- NF F 55-625
- RATP K20

Construction

- Conductors: Stranded bare copper conductor, 1.5mm^2 to IEC 60228 class 2.
- Insulation: XLPE.
- Filler & Inner Covering: LSZH.
- Armour: Galvanized steel tapes.
- Outer sheath: LSZH, antitermite, coloured black.



Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5
Maximum DC Conductor Resistance	Ω/km	12.2
Minimum Insulation resistance @500VDC	MΩ.km	1500
Voltage Rating	KV	0.6/1（0.45/0.75可选）

Mechanical and Thermal Properties:

- Miniumum Bending Radius: 10 x OD
- Operating Temperatures: -20℃ to +60℃ (during operation); -10℃ to +60℃ (during installation)

Core Identification

Colours coding: Black, Light blue, Brown, Green/Yellow, Black

Printed numbers up to 7 cores with Green/Yellow core

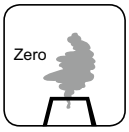
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Minimum Overall Diameter mm	Maximum Overall Diameter mm	Nominal Weight kg/km
RF/K25-RZ1F3Z1-U(AS)-0.6/1KV-2G1.5S	2 x 1.5	7/0.53	8.0	12.0	100
RF/K25-RZ1F3Z1-U(AS)-0.6/1KV-4G1.5S	4 x 1.5	7/0.53	12.5	14.5	300
RF/K25-RZ1F3Z1-U(AS)-0.6/1KV-12G1.5S	12 x 1.5	7/0.53	18.0	20.0	590
RF/K25-RZ1F3Z1-U(AS)-0.6/1KV-21G1.5S	21 x 1.5	7/0.53	22.0	24.0	830

U is changed to K if the stranding class is changed from class 2 to class 5

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

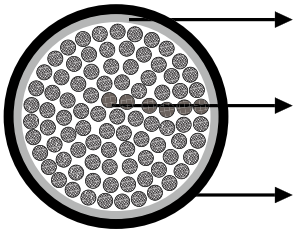
650/750V Track Feeder Cables to RT/E/S/21101

Applications

The cables can provide the 450/750 volt DC supply from Traction Substations and Track Paralleling Huts to conductor rails, negative cable connections and where appropriate bonding.

Standards

- NR/PS/ELP/21101 (formerly RT/E/S/21101)
- BS 638 Part 4
- UND 21027



Construction

- Conductors: Class 5 stranded aluminium or tinned copper to BS EN 60228:2005 (previously BS6360).
- Core wrapping: PETP (Polyethylene Terephthalate).
- Sheath: CSP(Chlorosulfonated Polyethylene) type RS4 to BS6899.
- H.O.F.R. heat resistant, oil resistant and flame retardant

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	161	500	630	150	240	500	800	1000
Conductor Material		copper			Aluminium				
Maximum DC Conductor Resistance	Ω/km	0.109	0.0369	0.0286	0.206	0.125	0.0605	0.0307	0.0291
Assigned Continuous Current Rating	A	550	1200	1500	430	550	800	1200	1500
Voltage Rating	KV	0.65/0.75							

Mechanical and Thermal Properties:

- Miniumum Bending Radius: 10 x OD (Aluminium Conductor); 8 x OD (Copper Conductor)
- Operating Temperatures: -25℃ to +85℃ (during operation); -10℃ to +70℃ (during installation)

Dimensions and Weight

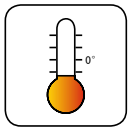
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km	Polarity/ Gland Size
Copper Conductor						
RF21101-H01N2-D-650/750V-1G161SCU	1 x 161	820/0.5	4.0	25.9	2050	negative/32

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km	Polarity/ Gland Size
RF21101-H01N2-D-650/750V-1G500SCU	1 x 500	1769/0.6	4.0	42.3	5582	negative/50
RF21101-H01N2-D-650/750V-1G630SCU	1 x 630	2257/0.6	4.0	45.9	6879	positive/63S
Aluminium Conductor						
RF21101-H01N2-D-650/750V-1G150SAL	1 x 150	756/0.5	4.0	20.5	581	negative/25
RF21101-H01N2-D-650/750V-1G240SAL	1 x 240	1221/0.5	4.0	29.6	1171	negative/40
RF21101-H01N2-D-650/750V-1G500SAL	1 x 500	1769/0.6	4.0	42.0	2361	positive/50
RF21101-H01N2-D-650/750V-1G800SAL	1 x 800	2825/0.6	4.0	50.2	3498	negative/63S
RF21101-H01N2-D-650/750V-1G1000SAL	1 x 1000	3531/0.6	4.0	55.0	4226	positive/63


Impact Resistant


Highly Flexible


Oil Resistant



Weather Resistant


Laid In Ducts

750V LSZH Track Feeder Cables to EME-SP-14-025/ SE908

Applications

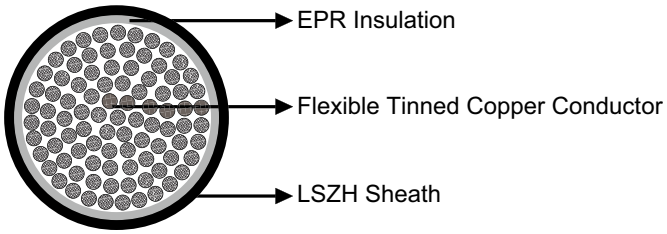
500/935 mm^2 LSZH track feeder cables.

Standards

- EME SP 14 025 (replaced by LUL 1-108 and Metronet MR SE908)
- UNE 21123

Construction

- Conductors: Stranded tinned copper conductors to IEC 60228 class 2 or 5.
- Insulation: EPR.
- Sheath: LSZH sheathed with yellow stripe.



Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	500	935
Maximum DC Conductor Resistance	Ω/km	0.0361	0.0194
Voltage Rating	KV	0.75	

Mechanical and Thermal Properties:

- Miniumum Bending Radius: 8 x OD
- Operating Temperatures: -25℃ to +85℃ (during operation); -10℃ to +70℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF14025-DZ1-U(AS)-750V-1G500S	1 x 500	91/2.65	8.5	54.0	7185
RF14025-DZ1-U(AS)-750V-1G935S	1 x 935	169/2.65	9.5	65.0	11749

U is changed to K if the stranding class is changed from class 2 to class 5

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

450/750V LSZH Single Core Conduit Wires to EME-SP-14-026

Applications

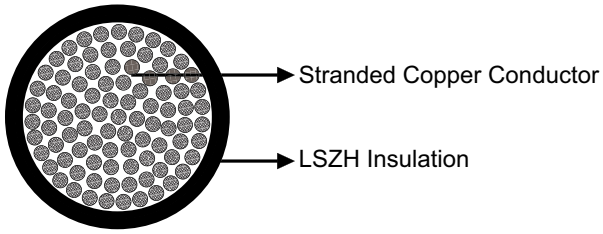
Single core LSZH conduit wire.

Standards

- EME SP 14 026 (LUL version of BS7211)
- UNE 211002

Construction

- Conductors: Stranded plain copper conductors to IEC 60228 class 2 or 5.
- Insulation: LSZH.



Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5	2.5	4.0	6.0	10.0	16.0	25.0	35.0	50.0	70.0
Maximum DC Conductor Resistance	Ω/km	12.1	7.41	4.61	3.08	1.83	1.15	0.727	0.524	0.387	0.268
Voltage Rating	KV	0.45/0.75									

□Continued□

Nominal Conductor Cross Section	mm^2	95	120	150	185	240	300	400	500	630
Maximum DC Conductor Resistance	Ω/km	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283
Voltage Rating	KV	0.45/0.75								

Mechanical and Thermal Properties

- Miniumum Bending Radius: 8 x OD
- Operating Temperatures: -25℃ to +85℃ (during operation); -10℃ to +70℃ (during installation)

Dimensions and Weight

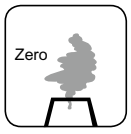
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF14026-ES07Z-U(AS)-450/750V-1G1.5S	1 x 1.5	7/0.53	0.7	3.0	22
RF14026-ES07Z-U(AS)-450/750V-1G2.5S	1 x 2.5	7/0.67	0.8	3.6	34
RF14026-ES07Z-U(AS)-450/750V-1G 4S	1 x 4.0	7/0.85	0.8	4.1	50
RF14026-ES07Z-U(AS)-450/750V-1G 6S	1 x 6.0	7/1.04	0.8	4.7	70

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF14026-ES07Z-U(AS)-450/750V-1G 10S	1 x 10.0	7/1.35	1.0	5.8	114
RF14026-ES07Z-U(AS)-450/750V-1G 16S	1 x 16.0	7/1.70	1.0	6.8	175
RF14026-ES07Z-U(AS)-450/750V-1G 25S	1 x 25.0	7/2.14	1.2	8.6	272
RF14026-ES07Z-U(AS)-450/750V-1G 35S	1 x 35.0	19/1.53	1.2	10.2	377
RF14026-ES07Z-U(AS)-450/750V-1G 50S	1 x 50.0	19/1.78	1.4	11.9	509
RF14026-ES07Z-U(AS)-450/750V-1G 70S	1 x 70.0	19/2.14	1.4	12.8	697
RF14026-ES07Z-U(AS)-450/750V-1G 95S	1 x 95.0	37/1.78	1.6	15.0	961
RF14026-ES07Z-U(AS)-450/750V-1G120S	1 x 120.0	37/2.03	1.6	16.6	1203
RF14026-ES07Z-U(AS)-450/750V-1G150S	1 x 150.0	37/2.25	1.8	18.5	1510
RF14026-ES07Z-U(AS)-450/750V-1G185S	1 x 185.0	37/2.52	2.0	20.8	1855
RF14026-ES07Z-U(AS)-450/750V-1G240S	1 x 240.0	61/2.25	2.2	25.4	2451
RF14026-ES07Z-U(AS)-450/750V-1G300S	1 x 300.0	61/2.52	2.4	28.1	3031
RF14026-ES07Z-U(AS)-450/750V-1G400S	1 x 400.0	61/2.85	2.6	31.6	3898
RF14026-ES07Z-U(AS)-450/750V-1G500S	1 x 500.0	61/3.20	2.8	35.2	4894
RF14026-ES07Z-U(AS)-450/750V-1G630S	1 x 630.0	127/2.52	2.8	39.1	6244

U is changed to K if the stranding class is changed from class 2 to class 5

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

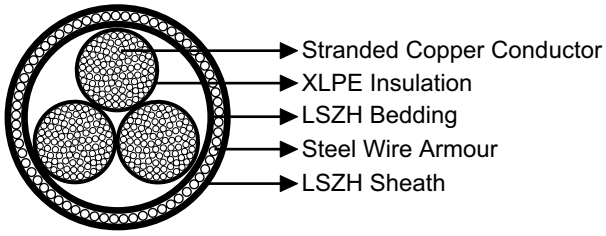
0.6/1KV Limited Fire Hazard/Fire Survival Multicore Armoured Cables to EME-SP-14-027

Applications

The cables are designed for station range installation typically in public help points (PHP), public address (PA), station announcement platforms (SAP) & CCTV camera power systems. The LSZH cables has been designed to provide superior flame retardance and circuit integrity if necessary, suitable for installation where fire, smoke emission and toxi fumes may create a potential threat.

Standards

- EME SP 14 027 (LUL version of BS6724 for fire retardant version and BS6387 for fire resisting version)
- UNE 21123



Construction

- Conductors: Stranded plain copper conductors to IEC 60228 class 2 or 5.
- Fire Barrier Tape (optional): Mica.
- Insulation: XLPE Insulation.
- Bedding: LSZH bedding
- Armoured: SWA
- Outer sheath: LSZH Sheath

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	2.5	4.0	6.0	10.0	16.0	25.0	35.0	50
Maximum DC Conductor Resistance	Ω/km	7.41	4.61	3.08	1.83	1.15	0.727	0.524	0.387
Voltage Rating	KV	0.6/1.0							

□Continued□

Nominal Conductor Cross Section	mm^2	70.0	95	120	150	185	240	300
Maximum DC Conductor Resistance	Ω/km	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601
Voltage Rating	KV	0.6/1.0						

Mechanical and Thermal Properties

- Miniumum Bending Radius: 8 x OD
- Operating Temperatures: 0℃ to +90℃ (during operation); 0℃ to +70℃ (during installation)

Dimensions and Weight

Cables without fire barrier tape

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G2.5S	2 x 2.5*	7/0.67	1.4	12.2	323
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G4S	2 x 4.0*	7/0.85	1.4	13.3	387
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G6S	2 x 6.0*	7/1.04	1.4	14.4	460
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G10S	2 x 10.0*	7/1.35	1.5	16.1	611
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G16S	2 x 16.0*	7/1.70	1.5	18.7	904
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G25S	2 x 25.0	7/2.14	1.6	21.0	1050
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G35S	2 x 35.0	19/1.53	1.7	22.0	1450
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G50S	2 x 50.0	19/1.78	1.8	24.0	1800
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G70S	2 x 70.0	19/2.14	1.9	27.0	2300
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G95S	2 x 95.0	37/1.78	2.0	32.0	3250
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G120S	2 x 120.0	37/2.03	2.1	35.0	3950
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G150S	2 x 150.0	37/2.25	2.2	38.0	4650
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G185S	2 x 185.0	37/2.52	2.4	43.0	6050
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G240S	2 x 240.0	61/2.25	2.5	49.0	7500
RF14027-RZ1MZ1-U(AS)-0.6/1KV-2G300S	2 x 300.0	61/2.52	2.6	54.0	9050
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G2.5S	3 x 2.5*	7/0.67	1.4	12.1	335
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G4S	3 x 4.0*	7/0.85	1.4	13.3	430
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G6S	3 x 6.0*	7/1.04	1.4	14.4	523
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G10S	3 x 10.0*	7/1.35	1.5	17.0	811
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G16S	3 x 16.0*	7/1.70	1.6	19.3	1072
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G25S	3 x 25.0	7/2.14	1.7	24.0	1750
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G35S	3 x 35.0	19/1.53	1.8	27.0	2000
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G50S	3 x 50.0	19/1.78	1.8	28.0	2450
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G70S	3 x 70.0	19/2.14	1.9	32.0	3250
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G95S	3 x 95.0	37/1.78	2.1	36.0	4500
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G120S	3 x 120.0	37/2.03	2.2	40.0	5350
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G150S	3 x 150.0	37/2.25	2.3	44.0	6900
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G185S	3 x 185.0	37/2.52	2.4	49.0	8200
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G240S	3 x 240.0	61/2.25	2.6	56.0	10350
RF14027-RZ1MZ1-U(AS)-0.6/1KV-3G300S	3 x 300.0	61/2.52	2.7	62.0	12600
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G2.5S	4 x 2.5*	7/0.67	1.4	13.6	406
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G4S	4 x 4.0*	7/0.85	1.4	14.9	505
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G6S	4 x 6.0*	7/1.04	1.5	17.1	737
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G10S	4 x 10.0*	7/1.35	1.5	18.9	969
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G16S	4 x 16.0*	7/1.70	1.6	21.5	1303
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G25S	4 x 25.0	7/2.14	1.7	27.0	2100
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G35S	4 x 35.0	19/1.53	1.8	29.0	2450
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G50S	4 x 50.0	19/1.78	1.9	32.0	3100
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G70S	4 x 70.0	19/2.14	2.1	37.0	4400
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G95S	4 x 95.0	37/1.78	2.2	41.0	5650
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G120S	4 x 120.0	37/2.03	2.3	46.0	7300
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G150S	4 x 150.0	37/2.25	2.4	51.0	8700
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G185S	4 x 185.0	37/2.52	2.6	55.0	10450
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G240S	4 x 240.0	61/2.25	2.7	63.0	13250
RF14027-RZ1MZ1-U(AS)-0.6/1KV-4G300S	4 x 300.0	61/2.52	2.9	68.0	16100

*Circular conductors

U is changed to K if the stranding class is changed from class 2 to class 5

Cables with fire barrier tape

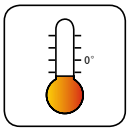
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G2.5S	2 x 2.5	7/0.67	1.4	13.1	352
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G4S	2 x 4.0	7/0.85	1.4	14.1	424
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G6S	2 x 6.0	7/1.04	1.4	15.2	504
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G10S	2 x 10.0	7/1.35	1.5	16.9	620
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G16S	2 x 16.0	7/1.70	1.5	19.5	954
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G 25S	2 x 25.0	7/2.14	1.6	25.5	1330
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G35S	2 x 35.0	19/1.53	1.7	29.1	1785
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G50S	2 x 50.0	19/1.78	1.8	32.2	2165
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G70S	2 x 70.0	19/2.14	1.9	28.8	2445
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G95S	2 x 95.0	37/1.78	2.0	33.9	3385
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G120S	2 x 120.0	37/2.03	2.1	37.2	4065
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G150S	2 x 150.0	37/2.25	2.2	39.9	4745
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G185S	2 x 185.0	37/2.52	2.4	45.0	6095
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G240S	2 x 240.0	61/2.25	2.5	50.0	7575
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-2G300S	2 x 300.0	61/2.52	2.6	55.0	9165
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G2.5S	3 x 2.5	7/0.67	1.4	13.7	392
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G4S	3 x 4.0	7/0.85	1.4	14.8	478
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G6S	3 x 6.0	7/1.04	1.4	16.0	573
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G10S	3 x 10.0	7/1.35	1.5	18.5	868
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G16S	3 x 16.0	7/1.70	1.6	20.8	1136
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G25S	3 x 25.0	7/2.14	1.7	27.6	1865
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G35S	3 x 35.0	19/1.53	1.8	30.9	2235
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G50S	3 x 50.0	19/1.78	1.8	33.9	2735
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G70S	3 x 70.0	19/2.14	1.9	35.7	3355
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G95S	3 x 95.0	37/1.78	2.1	38.2	4580
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G120S	3 x 120.0	37/2.03	2.2	41.6	5505
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G150S	3 x 150.0	37/2.25	2.3	47.0	6950
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G185S	3 x 185.0	37/2.52	2.4	50.5	8295
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G240S	3 x 240.0	61/2.25	2.6	57.2	10455
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-3G300S	3 x 300.0	61/2.52	2.7	63.2	12660
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G2.5S	4 x 2.5	7/0.67	1.4	14.7	454
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G4S	4 x 4.0	7/0.85	1.4	16.0	556
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G6S	4 x 6.0	7/1.04	1.5	18.2	783
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G10S	4 x 10.0	7/1.35	1.5	20.0	1029
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G16S	4 x 16.0	7/1.70	1.6	22.5	1367
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G25S	4 x 25.0	7/2.14	1.7	29.9	2240
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G35S	4 x 35.0	19/1.53	1.8	33.5	2705
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G50S	4 x 50.0	19/1.78	1.9	37.1	3375
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G70S	4 x 70.0	19/2.14	2.1	39.1	4560
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G95S	4 x 95.0	37/1.78	2.2	43.0	5805
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G120S	4 x 120.0	37/2.03	2.3	48.3	7430
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G150S	4 x 150.0	37/2.25	2.4	52.4	8820
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G185S	4 x 185.0	37/2.52	2.6	56.6	10600
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G240S	4 x 240.0	61/2.25	2.7	64.3	13380
RF14027-RZ1MZ1-U-MICA(AS+)-0.6/1KV-4G300S	4 x 300.0	61/2.52	2.9	70.7	16255

U is changed to K if the stranding class is changed from class 2 to class 5


Impact Resistant


Highly Flexible


Oil Resistant


Weather Resistant


Laid In Ducts

Insulation Integrity FE180
EN 50200/IEC 60331
/NF C32-070-2.3(CR1)

LU Section 12 Fire Integrity Cables

Applications

The cables are designed for installation typically in public help points (PHP), public address (PA), station announcement platforms (SAP) & CCTV camera power systems. The LSZH cables has been designed to provide superior flame retardance and circuit integrity, together with optimized ease of installation characteristics and complies with LU Section 12 station regulations.

Standards

- BS 7629-1/ 5839-1:2002/ 8434-1:2003/6387 C W Z
- BS EN 50200 (PH90)
- UNE 211025

Construction

- Conductors: Class 1 solid or Class 2 stranded annealed bare copper conductors to BS EN 60228:2005 (previously BS6360).
- Insulation: Silicone rubber insulation.
- Core Wrapping: Plastic tape(s) with overlapping.
- Screen: Aluminium/Polyester tape.
- Drain Wire: Tinned copper.
- Sheath: High performance, thermoplastic LSZH.

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.0	1.5	2.5
Maximum Conductor DC Resistance	Ω/km	18.1	12.1	7.41
Nominal Insulation Thickness	mm	0.6	0.7	0.8
Voltage Rating	KV	0.3/0.5		

Mechanical and Thermal Properties

- Minimum Bending Radius: 6xOD
- Temperature Range: -40℃ to +90℃ (during operation); -10℃ to +70℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Conductor Diameter		Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
		Stranded Conductor No/mm	Solid Conductor mm			
RFLU12-SOZ1-U-PH90(AS+)-300/500V-2G1S	2 x 1.0	7/0.44	1.13	1.3	7.0	83
RFLU12-SOZ1-U-PH90(AS+)-300/500V-3G1S	3 x 1.0	7/0.44	1.13	1.3	7.3	95
RFLU12-SOZ1-U-PH90(AS+)-300/500V-4G1S	4 x 1.0	7/0.44	1.13	1.3	8.2	115
RFLU12-SOZ1-U-PH90(AS+)-300/500V-7G1S	7 x 1.0	7/0.44	1.13	1.3	10.5	175
RFLU12-SOZ1-U-PH90(AS+)-300/500V-2G1.5S	2 x 1.5	7/0.53	1.38	1.4	7.9	110
RFLU12-SOZ1-U-PH90(AS+)-300/500V-3G1.5S	3 x 1.5	7/0.53	1.38	1.4	8.3	128
RFLU12-SOZ1-U-PH90(AS+)-300/500V-4G1.5S	4 x 1.5	7/0.53	1.38	1.4	9.5	160
RFLU12-SOZ1-U-PH90(AS+)-300/500V-7G1.5S	7 x 1.5	7/0.53	1.38	1.4	12.2	250
RFLU12-SOZ1-U-PH90(AS+)-300/500V-2G2.5S	2 x 2.5	7/0.67	1.78	1.5	9.3	160
RFLU12-SOZ1-U-PH90(AS+)-300/500V-3G2.5S	3 x 2.5	7/0.67	1.78	1.5	9.9	190
RFLU12-SOZ1-U-PH90(AS+)-300/500V-4G2.5S	4 x 2.5	7/0.67	1.78	1.5	11.3	235

U is changed to K if the stranding class is changed from class 2 to class 5


Impact Resistant


Highly Flexible


Oil Resistant


Weather Resistant


Laid In Ducts

Insulation Integrity FE180
EN 50200/IEC 60331
/NF C32-070-2.3(CR1)

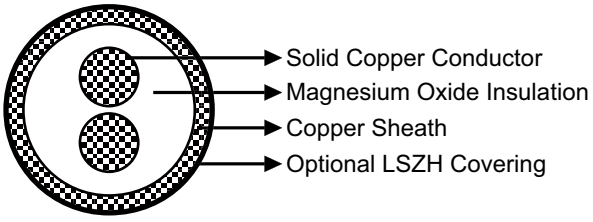
0.5/0.75KV Fire Survival Mineral Insulated Multicore LSZH Cables to EME-SP-14-028

Applications

These fire survival cables are designed for installation in hazardous installations and radioactive environments.

Standards

- EME SP 14 028
- BS 6387 CWZ
- BS 5839-1 Standard
- BS 5839-1 Enhanced
- BS 7346-6
- BS EN 60702



Construction

- Conductors: Solid plain copper conductors.
- Insulation: Magnesium Oxide.
- Outer sheath: Plain copper sheath with optional LSZH covering.

Electrical Characteristics at 20□

Light Duty 0.5KV Grade

Nominal Conductor Diameter	mm	1.13	1.39	1.77	2.25
Nominal Conductor Cross Section	mm^2	1.0	1.5	2.5	4.0
Maximum DC Conductor Resistance	Ω/km	18.1	12.1	7.41	4.61
Voltage Rating	KV	0.5			

Heavy Duty 0.75KV Grade

Nominal Conductor Diameter	mm	1.39	1.77	2.25	2.75	3.57	4.5	5.66	6.66	7.75
Nominal Conductor Cross Section	mm^2	1.5	2.5	4.0	6.0	10.0	16.0	25.0	35.0	50.0
Maximum DC Conductor Resistance	Ω/km	12.1	7.41	4.61	3.08	1.83	1.15	0.727	0.524	0.387
Voltage Rating	KV	0.75								

□Continued□

Nominal Conductor Diameter	mm	9.32	10.98	12.33	13.7	15.18	17.33	19.37	22.37
Nominal Conductor Cross Section	mm^2	70.0	95.0	120.0	150.0	185.0	240.0	300	400
Maximum DC Conductor Resistance	Ω/km	0.268	0.193	0.153	0.124	0.101	0.0775	0.0601	0.047
Voltage Rating	KV	0.75							

Mechanical and Thermal Properties

- Minimum Bending Radius: 2 x OD(D<7); 3 x OD(7 ≤ D<12); 4 x OD(12 ≤ D<15); 6 x OD(D ≥ 15)
- Temperature Range: -80℃ to +105℃

Dimensions and Weight

Light Duty 0.5KV Grade

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Cross Sectional Area of Copper Sheath mm^2	Nominal Overall Diameter mm		Nominal Weight kg/km	
			With LSZH Covering	Without LSZH Covering	With LSZH Covering	Without LSZH Covering
RF14028L-MICC-300/500V-2G1S	2 x 1.0	5.4	6.4	5.1	126	104
RF14028L-MICC-300/500V-2G1.5S	2 x 1.5	6.3	7.0	5.7	154	136
RF14028L-MICC-300/500V-2G2.5S	2 x 2.5	8.2	7.9	6.6	206	187
RF14028L-MICC-300/500V-2G4S	2 x 4.0	10.7	9.2	7.7	322	248
RF14028L-MICC-300/500V-3G1S	3 x 1.0	6.7	7.1	5.8	159	136
RF14028L-MICC-300/500V-3G1.5S	3 x 1.5	7.8	7.7	6.4	194	176
RF14028L-MICC-300/500V-3G2.5S	3 x 2.5	9.5	8.8	7.3	272	223
RF14028L-MICC-300/500V-4G1S	4 x 1.0	7.7	7.6	6.3	187	162
RF14028L-MICC-300/500V-4G1.5S	4 x 1.5	9.1	8.3	7.0	231	203
RF14028L-MICC-300/500V-4G2.5S	4 x 2.5	11.3	9.6	8.1	336	277
RF14028L-MICC-300/500V-7G1S	7 x 1.0	11.0	9.3	7.6	269	236
RF14028L-MICC-300/500V-7G1.5S	7 x 1.5	11.8	9.9	8.4	351	295
RF14028L-MICC-300/500V-7G2.5S	7 x 2.5	15.4	11.2	9.7	475	411

Heavy Duty 0.75KV Grade

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Cross Sectional Area of Copper Sheath mm^2	Nominal Overall Diameter mm		Nominal Weight kg/km	
			With LSZH Covering	Without LSZH Covering	With LSZH Covering	Without LSZH Covering
RF14028H-MICC-450/750V-1G6S	1 x 6.0	8.0	7.7	6.2	213	173
RF14028H-MICC-450/750V-1G10S	1 x 10.0	9.0	8.8	7.3	273	240
RF14028H-MICC-450/750V-1G16S	1 x 16.0	12.0	9.8	8.3	361	326
RF14028H-MICC-450/750V-1G25S	1 x 25.0	15.0	11.1	9.6	506	457
RF14028H-MICC-450/750V-1G35S	1 x 35.0	18.0	12.2	10.7	650	585
RF14028H-MICC-450/750V-1G50S	1 x 50.0	22.0	13.6	12.1	842	758
RF14028H-MICC-450/750V-1G70S	1 x 70.0	27.0	15.2	13.7	1147	1016
RF14028H-MICC-450/750V-1G95S	1 x 95.0	32.0	17.4	15.4	1520	1324
RF14028H-MICC-450/750V-1G120S	1 x 120.0	37.0	18.8	16.8	1870	1612
RF14028H-MICC-450/750V-1G150S	1 x 150.0	44.0	20.4	18.4	2230	1949
RF14028H-MICC-450/750V-1G185S	1 x 185.0	54.0	23.2	20.4	2575	2370
RF14028H-MICC-450/750V-1G240S	1 x 240.0	70.0	26.1	23.3	3312	3050
RF14028H-MICC-450/750V-1G300S	1 x 300.0	79.0	28.8	26.0	3972	3791
RF14028H-MICC-450/750V-1G400S	1 x 400.0	91.0	32.8	30.0	5211	5004
RF14028H-MICC-450/750V-2G1.5S	2 x 1.5	11.0	9.4	7.9	259	237
RF14028H-MICC-450/750V-2G2.5S	2 x 2.5	13.0	10.2	8.7	314	276
RF14028H-MICC-450/750V-2G4S	2 x 4.0	16.0	11.3	9.8	398	355
RF14028H-MICC-450/750V-2G6S	2 x 6.0	18.0	12.4	10.9	483	446
RF14028H-MICC-450/750V-2G10S	2 x 10.0	24.0	14.2	12.7	697	619
RF14028H-MICC-450/750V-2G16S	2 x 16.0	30.0	16.2	14.7	968	850
RF14028H-MICC-450/750V-2G25S	2 x 25.0	38.0	19.1	17.1	1275	1178

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Cross Sectional Area of Copper Sheath mm^2	Nominal Overall Diameter mm		Nominal Weight kg/km	
			With LSZH Covering	Without LSZH Covering	With LSZH Covering	Without LSZH Covering
RF14028H-MICC-450/750V-3G1.5S	3 x 1.5	12.0	9.8	8.3	290	254
RF14028H-MICC-450/750V-3G2.5S	3 x 2.5	14.0	10.8	9.3	365	323
RF14028H-MICC-450/750V-3G4S	3 x 4.0	17.0	11.9	10.4	461	415
RF14028H-MICC-450/750V-3G6S	3 x 6.0	20.0	13.0	11.5	590	526
RF14028H-MICC-450/750V-3G10S	3 x 10.0	27.0	15.1	13.6	853	754
RF14028H-MICC-450/750V-3G16S	3 x 16.0	34.0	17.1	15.6	1080	1034
RF14028H-MICC-450/750V-3G25S	3 x 25.0	42.0	20.2	18.2	1548	1444
RF14028H-MICC-450/750V-4G1.5S	4 x 1.5	14.0	10.6	9.1	344	305
RF14028H-MICC-450/750V-4G2.5S	4 x 2.5	16.0	11.6	10.1	430	384
RF14028H-MICC-450/750V-4G4S	4 x 4.0	20.0	12.9	11.4	577	507
RF14028H-MICC-450/750V-4G6S	4 x 6.0	24.0	14.2	12.7	718	644
RF14028H-MICC-450/750V-4G10S	4 x 10.0	30.0	16.3	14.8	1050	911
RF14028H-MICC-450/750V-4G16S	4 x 16.0	39.0	19.3	17.3	1390	1286
RF14028H-MICC-450/750V-4G25S	4 x 25.0	49.0	22.3	20.1	1943	1805
RF14028H-MICC-450/750V-7G1.5S	7 x 1.5	18.0	12.3	10.8	478	432
RF14028H-MICC-450/750V-7G2.5S	7 x 2.5	22.0	13.6	12.1	614	559
RF14028H-MICC-450/750V-12G1.5S	12 x 1.5	28.0	15.8	14.1	772	712
RF14028H-MICC-450/750V-12G2.5S	12 x 2.5	34.0	17.9	15.6	970	911
RF14028H-MICC-450/750V-19G1.5S	19 x 1.5	37.0	18.9	16.6	1086	992


Impact Resistant


Highly Flexible


Oil Resistant


Weather Resistant


Laid In Ducts

Insulation Integrity FE180
EN 50200/IEC 60331
/NF C32-070-2.3(CR1)

Pigtail Rail Connection Cables to SE260L

Applications

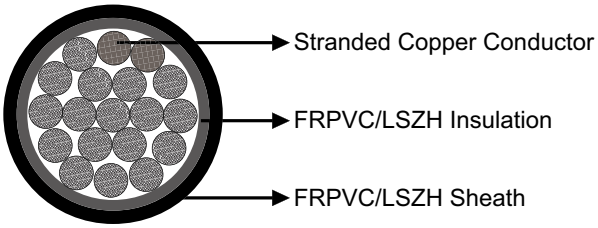
These connection cables are designed for use in signalling equipment rooms.

Standards

- SE260
- UNE 21123

Construction

- Conductors: Stranded plain copper conductors to IEC 60228 class 2 or 5.
- Insulation: FRPVC. (LSZH as option)
- Outer sheath: FRPVC. (LSZH as option)



Optional

Limited fire hazard pigtail rail connection cables: Stranded tinned copper conductors, LSZH composite insulation.

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	16
Maximum DC Conductor Resistance	Ω/km	1.15/1.16*
Voltage Rating	KV	0.6/1.0

*For LSZH cable

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD
- Temperature Range: -25℃ to +85℃ (during operation);
  -10℃ to +70℃ (during installation)

PVC Sheath

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF260-VV-K-0.6/1KV-1G16S	1 x 16	19/1.04	0.7	1.4	10.3	249
RF260-RZ1-K-0.6/1KV-1G16S	1 x 16	19/1.04	0.7	1.4	10.3	255

K is changed to U if the stranding class is changed from class 5 to class 2

LSZH Sheath

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

0.45/0.75KV Limited Fire Hazard Earthing Cables to SE774

Applications

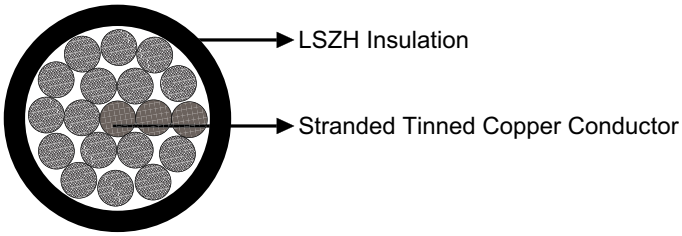
The single core signaling earth and power cables are used in safety signaling equipment rooms.

Standards

- SE774
- UNE 21027

Construction

- Conductors: Stranded tinned copper conductors.
- Insulation: Thermoplastic LSZH.



Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.0	4.0	6.0	16.0	35.0
Maximum DC Conductor Resistance	Ω/km	18.2	4.7	3.11	1.16	0.529
Voltage Rating	KV	0.45/0.75				

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD
- Temperature Range: -25℃ to +85℃ (during operation); -10℃ to +70℃ (during installation)

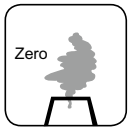
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF774-ES07Z-U-450/750V-1G1S	1 x 1.0	1/1.13	0.6	4.0	28
RF774-ES07Z-U-450/750V-1G4S	1 x 4.0	7/0.85	0.8	5.5	33
RF774-ES07Z-U-450/750V-1G6S	1 x 6.0	7/1.04	0.8	6.1	90
RF774-ES07Z-U-450/750V-1G16S	1 x 16.0	7/1.7	1.0	8.1	197
RF774-ES07Z-U-450/750V-1G35S	1 x 35.0	19/1.53	1.2	10.9	389

U is changed to K if the stranding class is changed from class 2 to class 5

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

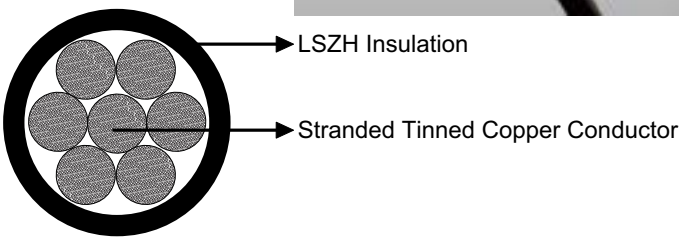
0.12KV Limited Fire Hazard Track Circuit Feeder Cables to SE895

Applications

The cables are designed for making connection across the track at the ballast level to the running rails for the signaling track circuits. They are characterized by being high resistant to mechanical damage, fire and contaminants such as oil and water.

Standards

- SE895
- UNE 21027



Construction

- Conductors: Stranded tinned copper conductors to IEC 60228 class 2 or 5.
- Insulation: LSZH Insulation.

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	4.0
Maximum DC Conductor Resistance	Ω/km	4.7
Voltage Rating	KV	0.3/0.5

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD
- Temperature Range: -25℃ to +85℃ (during operation); -10℃ to +70℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF895-ES05Z-U-300/500V-1G4S	1 x 4.0	7/0.85	0.8	6.8	85

U is changed to K if the stranding class is changed from class 2 to class 5


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

0.6/1KV Limited Fire Hazard Rail Connection Cables to SE902

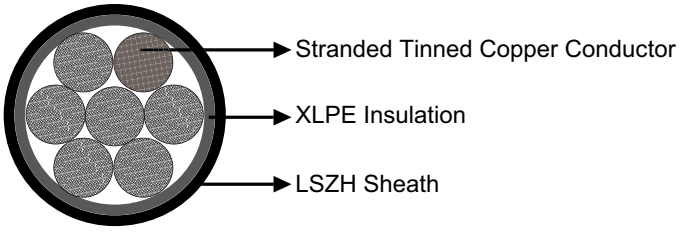
Applications

The single core high performance power cables are used in safety signalling equipment rooms.

Standards

- SE902
- UNE 21123

Construction



- Conductors: Stranded tinned copper conductors to IEC 60228 class 2 or 5.
- Insulation: XLPE.
- Sheath: LSZH.

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	4.0
Maximum DC Conductor Resistance	Ω/km	4.7
Voltage Rating	KV	0.6/0.1

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD
- Temperature Range: -25℃ to +85℃ (during operation); -10℃ to +70℃ (during installation)

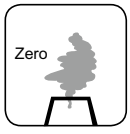
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF902-RZ1-U-0.6/1KV-1G4S	1 x 4.0	7/0.85	0.8	8.8	124

U is changed to K if the stranding class is changed from class 2 to class 5

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

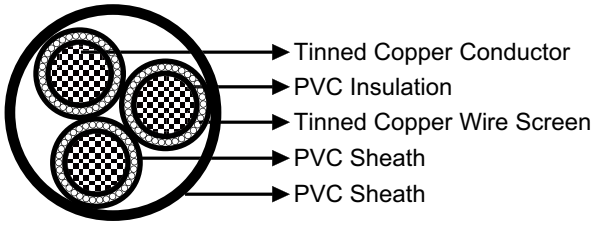
Concentric Signalling Cables Type 1 to SE1047

Applications

The mission critical signalling cables are used between central signalling terminations frame and vital signalling equipments.

Standards

- SE1047
- UNE 21031



Construction

- Conductors: Solid tinned copper conductors.
- Insulation: PVC.
- Screen：TCW (Tinned Copper Wire) screen.
- Inner Sheath: PVC.
- Outer Sheath: PVC.

Optional

Limited fire hazard concentric signalling cables: Stranded tinned copper conductors, XLPE insulation, TCW screen, PE sheath, units laid up, LFH sheath. (SE 1047 Type 2)

Concentric signalling screened cables: Stranded tinned copper conductors, PVC insulation, TCW spiral screen, PVC sheath, TCWB, units laid up, PVC sheath. (SE 1047 Type 3)

Limited fire hazard concentric signalling screened cables: Stranded tinned copper conductors, XLPE insulation, TCW spiral screen, PE sheath, TCWB, units laid up, LFH sheath. (SE 1047 Type 4)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.85
Maximum DC Conductor Resistance	Ω/km	11
Maximum DC Screen Resistance	Ω/km	9.66

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD
- Temperature Range: -25℃ to +85℃ (during operation); -10℃ to +70℃ (during installation)

Dimensions and Weight

SE 1047 Type 1 Concentric Signalling PVC Sheathed Cables

Cable Code	No. of units& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF1047-VC4VV-450/750V-1G1.85S	1 x 1.85	1/1.53	0.7	10.9	173
RF1047-VC4VV-450/750V-3G1.85S	3 x 1.85	1/1.53	0.7	18.4	453
RF1047-VC4VV-450/750V-7G1.85S	7 x 1.85	1/1.53	0.7	23.9	771
RF1047-VC4VV-450/750V-19G1.85S	19 x 1.85	1/1.53	0.7	36.8	1815

SE 1047 Type 2 Concentric Signalling LFH Sheathed Cables

Cable Code	No. of units& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF1047-RC4Z1Z1-450/750V-1G1.85S	1 x 1.85	1/1.53	0.7	10.3	140
RF1047-RC4Z1Z1-450/750V-3G1.85S	3 x 1.85	1/1.53	0.7	17.1	361
RF1047-RC4Z1Z1-450/750V-7G1.85S	7 x 1.85	1/1.53	0.7	22.1	612
RF1047-RC4Z1Z1-450/750V-19G1.85S	19 x 1.85	1/1.53	0.7	33.8	1429

SE 1047 Type 3 Concentric Signalling Screened PVC Sheathed Cables

Cable Code	No. of units& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF1047-VC4VC4V-450/750V-1G1.85S	1 x 1.85	1/1.53	0.8	11.6	210
RF1047- VC4VC4V-450/750V-3G1.85S	3 x 1.85	1/1.53	0.8	19.9	561
RF1047- VC4VC4V-450/750V-7G1.85S	7 x 1.85	1/1.53	0.8	25.9	987
RF1047-VC4VC4V-450/750V-19G1.85S	19 x 1.85	1/1.53	0.8	40.2	2375

SE 1047 Type 4 Concentric Signalling Screened LFH Sheathed Cables

Cable Code	No. of units& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF1047-RC4Z1C4Z1-450/750V-1G1.85S	1 x 1.85	1/1.53	0.8	11.0	184
RF1047-RC4Z1C4Z1-450/750V-3G1.85S	3 x 1.85	1/1.53	0.8	18.6	487
RF1047-RC4Z1C4Z1-450/750V-7G1.85S	7 x 1.85	1/1.53	0.8	24.1	875
RF1047-RC4Z1C4Z1-450/750V-19G1.85S	19 x 1.85	1/1.53	0.8	37.2	2120

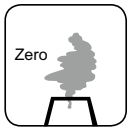
PVC Sheath

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

LSZH Sheath

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

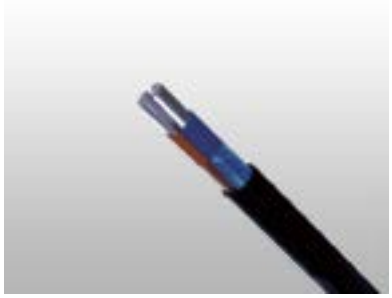
Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

Trackside Signalling Aluminium Power Cables to BR880

Applications

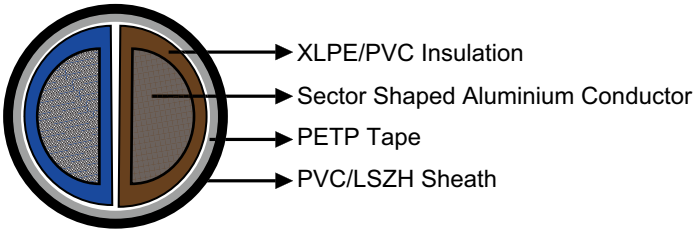
BR880 solid sector shaped conductors for trackside signalling power supplies.



Standards

- BR880
- BS5467
- BS6346
- UNE 21123

Construction



- Conductors: Sector shaped solid plain aluminium to IEC 60228 class 2 or 5.
- Insulation: XLPE type GP8 to BS7655 or PVC type TI 1 to BS 7655.
- Core wrapping: PETP (Polyethylene Terephthalate).
- Sheath: PVC type 9 to BS7655 (LSZH can be offered as an option).

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	16	25	35	50	70	95
Maximum Conductor Resistance	Ω/km	1.91*	1.2*	0.868*	0.641	0.443	0.32**
Voltage Rating	KV	0.6/1.0					

* Aluminium conductors 10mm^2 to 35mm^2 circular only.

** For single core cables, four sectoral shaped conductors may be assembled info a single circular conductor. The maximum resistance of the assembled conductor shall be 25% of that of the individual component conductors.

Mechanical and Thermal Properties

- Minimum Bending Radius: 10xOD
- Temperature Range: -30℃ to +70℃ (during operation); -10℃ +55℃ (during installation)

Core Identification

2 core: Brown/Blue

4 core: Blue/Brown/Black/Grey

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Thickness of Insulation mm	Nominal Thickness of Sheath mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF880-RV-K-0.6/1KV-2G16SAL	2 x 16	1.0	1.8	14.3	420
RF880-RV-K-0.6/1KV-2G25SAL	2 x 25	1.2	1.8	16.6	455
RF880-RV-K-0.6/1KV-2G35SAL	2 x 35	1.2	1.8	18.0	525
RF880-RV-K-0.6/1KV-2G50SAL	2 x 50	1.4	1.8	20.4	620
RF880-RV-K-0.6/1KV-2G70SAL	2 x 70	1.4	1.9	22.8	840
RF880-RV-K-0.6/1KV-2G95SAL	2 x 95	1.6	2.0	26.2	1020
RF880-RV-K-0.6/1KV-4G70SAL	4 x 70	1.4	2.0	30.6	1750
RF880-RV-K-0.6/1KV-4G95SAL	4 x 95	1.6	2.2	35.5	2100

K is changed to U if the stranding class is changed from class 5 to class 2

PVC Sheath

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

LSZH Sheath

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

Point Heating Cables to NR/SP/ELP/40045

Applications

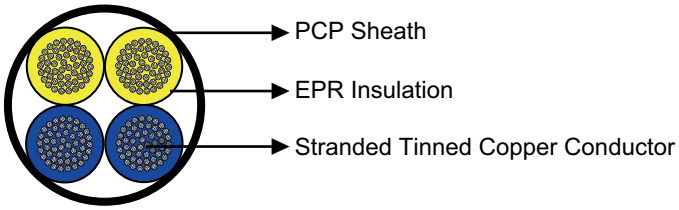
The cables are designed for power distribution in points heating system. These heavy duty cables offer protection from abrasion and mechanical impact whilst maintaining flexibility to ease installation.

Standards

- NR/SP/ELP/40045 (formerly RT/E/PS/40045)
- BS7919
- UNE 21027

Construction

- Conductors: Class 5 tinned copper conductors to BS6360.
- Insulation: EPR type GP4 to BS 7655.
- Sheath: PCP type EM2 to BS 7655.



Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5	2.5	4.0	6.0
Maximum Conductor Resistance	Ω/km	13.7	8.21	5.09	3.39
Voltage Rating	KV	0.3/0.5			

Mechanical and Thermal Properties

- Minimum Bending Radius: 7.5xOD
- Temperature Range: -30℃ to +70℃ (during operation); -10℃ +55℃ (during installation)

Core identification

4core yellow, yellow, blue, blue

8core yellow, yellow, blue, blue, Brown, brown, black, black

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Thickness of Insulation mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF40045-H05RNF-300/500V-4G1.5S	4 x 1.5	30/0.25	0.8	14.3	220
RF40045-H05RNF-300/500V-4G2.5S	4 x 2.5	50/0.25	0.9	16.5	390
RF40045-H05RNF-300/500V-4G4S	4 x 4.0	56/0.30	1.0	18.5	420
RF40045-H05RNF-300/500V-8G1.5S	8 x 1.5	30/0.25	0.8	18.5	460
RF40045-H05RNF-300/500V-8G2.5S	8 x 2.5	50/0.25	0.9	21.4	510
RF40045-H05RNF-300/500V-8G4S	8 x 4.0	56/0.25	1.0	23.6	830
RF40045-H05RNF-300/500V-8G6S	8 x 6.0	84/0.30	1.0	25.6	1040
RF40045-H05RNF-300/500V-8G10S	8 x 10.0	75/0.40	1.2	31.7	1799
RF40045-H05RNF-300/500V-8G16S	8 x 16.0	118/0.40	1.2	36.2	2480


Impact Resistant


Highly Flexible


Oil Resistant


Weather Resistant


Laid In Ducts

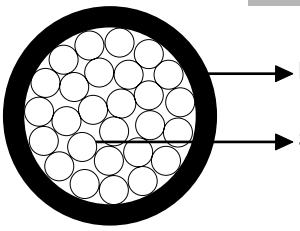
FTN Screening Conductor Cables

Applications

The cables are designed to be used for the purpose of screening telecommunication cables from electrical interference.

Standard

- NR/PS/TEL/31102(BR1817)
- BS6485



Construction

- Conductors: Single core stranded aluminium to BS215PT1.
- Insulation: PVC type 16 to BS6485 or LSZH.

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	150	250
Maximum DC Conductor Resistance	Ω/km	0.1825	0.1083

Mechanical and Thermal Properties

- Minimum Bending Radius: 9xOD
- Temperature Range: 0℃ to +70℃ (during operation);
  0℃ to +55℃ (during installation)

PVC Sheath

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF31102-H07V-U-450/750V-1G150SAL	1 x 150	19/3.25	1.6	19.45	629
RF31102-H07V-U-450/750V-1G250SAL	1 x 250	19/4.22	1.6	24.30	995

U is changed to K if the stranding class is changed from class 2 to class 5

LSZH Sheath

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

NSGAFOU Cables

Applications

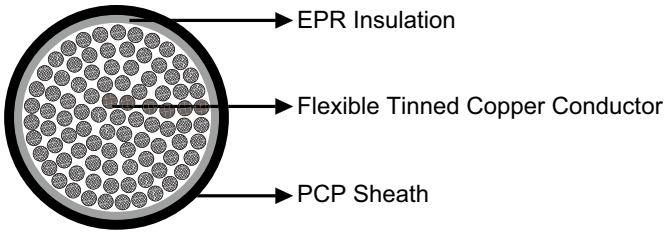
The cables are designed for use in switch cabinets, wiring of devices, trains and buses as well as in dry rooms.

Standards

- DIN VDE 0250-602

Construction

- Conductors: Flexible tinned copper to IEC 60228 class 5
- Insulation: EPR type 3G13.
- Outer sheath: PCP type 5GM3.



Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5	2.5	4.0	6.0	10	16	25	35
Conductor Resistance	Ω/km	13.7	8.21	5.09	3.39	1.95	1.24	0.795	0.565
Current Rating	A	31	41	58	75	103	145	194	240
Voltage Rating	KV	1.8/3							

Continued

Nominal Conductor Cross Section	mm^2	50	70	95	120	150	185	240
Conductor Resistance	Ω/km	0.393	0.277	0.21	0.164	0.132	0.109	0.0817
Current Rating	A	301	372	456	528	607	639	821
Voltage Rating	KV	1.8/3						

Mechanical and Thermal Properties

- Minimum Bending Radius: 4 x OD
- Temperature Range: -25℃ to +80℃ (during operation); -10℃ to +60℃ (during installation)

Dimensions and Weight

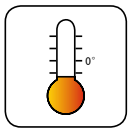
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF602-NSGAFOU-1G1.5S	1 x 1.5	30/0.25	1.3	6.5	59
RF602-NSGAFOU-1G2.5S	1 x 2.5	50/0.25	1.3	6.8	74

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF602-NSGAFOU-1G4S	1 x 4.0	56/0.3	1.3	7.7	94
RF602-NSGAFOU-1G6S	1 x 6.0	84/0.3	1.3	8.3	118
RF602-NSGAFOU-1G10S	1 x 10.0	80/0.4	1.5	9.2	163
RF602-NSGAFOU-1G16S	1 x 16.0	126/0.4	1.5	10.1	220
RF602-NSGAFOU-1G25S	1 x 25.0	196/0.40	1.8	12.5	336
RF602-NSGAFOU-1G35S	1 x 35.0	276/0.40	1.8	14.0	470
RF602-NSGAFOU-1G50S	1 x 50.0	396/0.40	1.8	15.5	581
RF602-NSGAFOU-1G75S	1 x 70.0	360/0.50	1.8	17.0	772
RF602-NSGAFOU-1G95S	1 x 95.0	475/0.50	2.2	19.5	1030
RF602-NSGAFOU-1G120S	1 x 120.0	608/0.50	2.2	21.2	1280
RF602-NSGAFOU-1G150S	1 x 150.0	756/0.50	2.2	23.5	1650
RF602-NSGAFOU-1G185S	1 x 185.0	925/0.50	2.4	25.6	2050
RF602-NSGAFOU-1G240S	1 x 240.0	1221/0.50	2.6	27.3	2590


Impact Resistant


Highly Flexible


Oil Resistant


Weather Resistant


Laid In Ducts

33KV Power Cables to BS 7835 NR/PS/00008

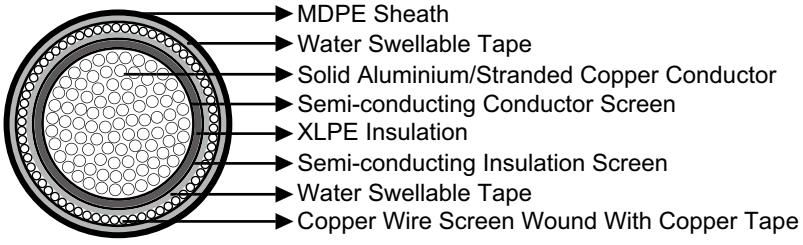
Applications

The cables are used to distribute three phase a.c. electrical power supplies at nominal system voltages of 33KV to traction substations on D.C. electrified lines.

Standard

- NR/PS/TEL/00008(formerly RT/E/PS/00008)
- BS6622, BS6234, BS7454
- IEC 60502-2, IEC60840

Construction



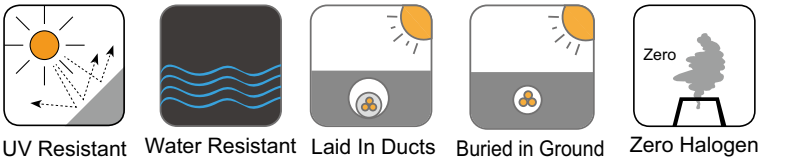
- Conductors: Class 1 circular solid aluminium (for 185 mm²) or class 2 compact circular stranded plain copper (for 300mm²) to BS EN 60228:2005 (previously BS 6360).
- Conductor Screen: Extruded semi-conducting XLPE (Cross-Linked Polyethylene) solidly bonded.
- Insulation: XLPE (Cross-Linked Polyethylene)
- Insulation Screen: Extruded semi-conducting XLPE (Cross-Linked Polyethylene), solidly bonded and cold strippable
- Separator: Semi conducting water blocking tape.
- Screen: Copper wire screen, helically wound with equalising copper tape
- Separator: Semi conducting water blocking tape.
- Sheath: Graphite coated MDPE type TS2.

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	185	300
Maximum DC Conductor Resistance	Ω/km	0.164	0.0601
Capacitance	μF/km	0.205	0.243
Voltage Rating	KV	19/33	19/33

Mechanical and Thermal Properties

- Minimum Bending Radius: 15xOD
- Temperature Range: 0℃ to +90℃ (during operation); 0℃ to +60℃ (during installation)



UV Resistant | Water Resistant | Laid In Ducts | Buried in Ground | Zero Halogen

IEC 60754-1/NF C20-454
EN 50267-2-1

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Thickness of Conductor Screen mm	Nominal Thickness of Insulation &Insulation Screen mm/mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF00008-RHZ1H16-11/33KV-1G185SAL	1 x 185	0.9	8.0/0.6	45.0	2200
RF00008-RHZ1H16-11/33KV-1G300SCU	1 x 300	0.9	8.0/0.6	50.0	4500

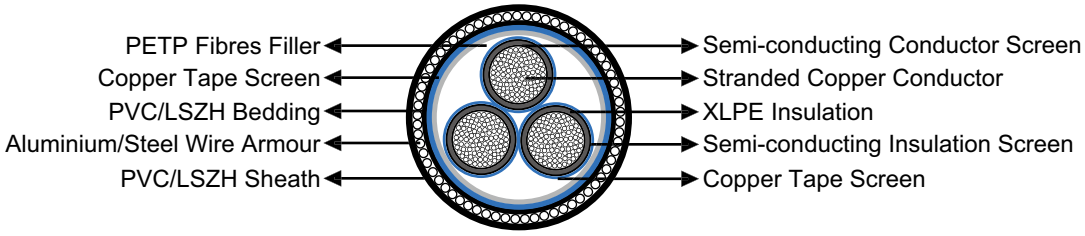
11KV LSZH Power Cables to BS 7835

Applications

The cables are power cables for power networks, underground, outdoors and in cable ducting, in particular for installation where fire, smoke emission and toxic fumes create a potential threat.

Standard

- BS7835
- BS EN 50267-2-1



Construction

- Conductor: Class 2 stranded plain copper conductor to BS EN 60228:2005 (previously BS6360)
- Conductor Screen: Semi-conducting material
- Insulation: XLPE Type GP8 to BS7655
- Insulation Screen: Semi-conducting material
- Metallic Screen: Individual and overall copper tape screen to BS6622
- Filler: PETP (Polyethylene Terephthalate) fibres
- Separator: Binding tape
- Bedding: LSZH
- Armour: Aluminium wire armoured (AWA) (for single core cables) or steel wire armoured (SWA) (for multicore cables)
- Sheath: LSZH.

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	50	70	95	120	150	185	240
Maximum DC Conductor Resistance	Ω/km	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754
Voltage Rating	KV	11						

□Continued□

Nominal Conductor Cross Section	mm^2	300	400	500	630	800	1000
Maximum DC Conductor Resistance	Ω/km	0.0601	0.047	0.0366	0.0283	0.0221	0.0176
Voltage Rating	KV	11					

Mechanical and Thermal Properties

- Minimum Bending Radius: 15xOD (for single core cables); 12xOD(for three core cables).
- Temperature Range: 0℃ to +90℃ (during operation); 0℃ to +60℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm/mm		Nominal Overall Diameter mm	Nominal Weight kg/km
			Inner	Outer		
Copper Conductor						
RF7835-RHZ1MZ1-6.35/11KV-1G50SCU	1 x 50	3.4	1.2	1.8	28.5	1200
RF7835-RHZ1MZ1-6.35/11KV-1G70SCU	1 x 70	3.4	1.2	1.9	30.0	1500
RF7835-RHZ1MZ1-6.35/11KV-1G95SCU	1 x 95	3.4	1.2	1.9	31.7	1600
RF7835-RHZ1MZ1-6.35/11KV-1G120SCU	1 x 120	3.4	1.2	2.0	33.9	2100
RF7835-RHZ1MZ1-6.35/11KV-1G150SCU	1 x 150	3.4	1.2	2.1	35.7	2500
RF7835-RHZ1MZ1-6.35/11KV-1G185SCU	1 x 185	3.4	1.2	2.1	37.5	2900
RF7835-RHZ1MZ1-6.35/11KV-1G240SCU	1 x 240	3.4	1.2	2.2	40.0	3600
RF7835-RHZ1MZ1-6.35/11KV-1G300SCU	1 x 300	3.4	1.2	2.2	43.0	4300
RF7835-RHZ1MZ1-6.35/11KV-1G400SCU	1 x 400	3.4	1.2	2.4	45.8	5200
RF7835-RHZ1MZ1-6.35/11KV-1G500SCU	1 x 500	3.4	1.3	2.5	50.5	6500
RF7835-RHZ1MZ1-6.35/11KV-1G630SCU	1 x 630	3.4	1.4	2.6	54.8	8000
RF7835-RHZ1MZ1-6.35/11KV-1G800SCU	1 x 800	3.4	1.5	2.7	59.2	9850
RF7835-RHZ1MZ1-6.35/11KV-1G1000SCU	1 x 1000	3.4	1.6	2.9	64.3	12100
RF7835-RHZ1MZ1-6.35/11KV-3G25SCU	3 x 25	3.4	1.3	2.4	48.8	4300
RF7835-RHZ1MZ1-6.35/11KV-3G35SCU	3 x 35	3.4	1.3	2.5	51.6	4700
RF7835-RHZ1MZ1-6.35/11KV-3G50SCU	3 x 50	3.4	1.4	2.6	54.6	5300
RF7835-RHZ1MZ1-6.35/11KV-3G70SCU	3 x 70	3.4	1.4	2.7	58.5	6300
RF7835-RHZ1MZ1-6.35/11KV-3G95SCU	3 x 95	3.4	1.5	2.8	62.6	7300
RF7835-RHZ1MZ1-6.35/11KV-3G120SCU	3 x 120	3.4	1.6	3.0	66.6	8400
RF7835-RHZ1MZ1-6.35/11KV-3G150SCU	3 x 150	3.4	1.6	3.1	69.8	9600
RF7835-RHZ1MZ1-6.35/11KV-3G185SCU	3 x 185	3.4	1.7	3.2	74.1	11000
RF7835-RHZ1MZ1-6.35/11KV-3G240SCU	3 x 240	3.4	1.8	3.4	81.2	14000
RF7835-RHZ1MZ1-6.35/11KV-3G300SCU	3 x 300	3.4	1.9	3.6	87.0	16600
RF7835-RHZ1MZ1-6.35/11KV-3G400SCU	3 x 400	3.4	2.0	3.8	95.0	19500
Aluminium Conductor						
RF7835-RHZ1MZ1-6.35/11KV-1G50SAL	1 x 50	3.4	1.2	1.8	39.3	1740
RF7835-RHZ1MZ1-6.35/11KV-1G70SAL	1 x 70	3.4	1.2	1.9	41.0	1850
RF7835-RHZ1MZ1-6.35/11KV-1G95SAL	1 x 95	3.4	1.2	1.9	42.9	2100
RF7835-RHZ1MZ1-6.35/11KV-1G120SAL	1 x 120	3.4	1.2	2.0	44.5	2250
RF7835-RHZ1MZ1-6.35/11KV-1G150SAL	1 x 150	3.4	1.2	2.1	47.3	2600
RF7835-RHZ1MZ1-6.35/11KV-1G185SAL	1 x 185	3.4	1.2	2.1	49.3	2850
RF7835-RHZ1MZ1-6.35/11KV-1G240SAL	1 x 240	3.4	1.2	2.2	51.7	3150
RF7835-RHZ1MZ1-6.35/11KV-1G300SAL	1 x 300	3.4	1.2	2.2	54.4	3600
RF7835-RHZ1MZ1-6.35/11KV-1G400SAL	1 x 400	3.4	1.2	2.4	57.7	4000
RF7835-RHZ1MZ1-6.35/11KV-1G500SAL	1 x 500	3.4	1.3	2.5	61.1	4500
RF7835-RHZ1MZ1-6.35/11KV-1G630SAL	1 x 630	3.4	1.4	2.6	65.0	5250
RF7835-RHZ1MZ1-6.35/11KV-1G800SAL	1 x 800	3.4	1.5	2.7	71.6	6150
RF7835-RHZ1MZ1-6.35/11KV-1G1000SAL	1 x 1000	3.4	1.6	2.9	76.5	7200
RF7835-RHZ1MZ1-6.35/11KV-3G50SAL	3 x 50	3.4	1.4	2.6	78.2	8300
RF7835-RHZ1MZ1-6.35/11KV-3G70SAL	3 x 70	3.4	1.4	2.7	82.1	9050
RF7835-RHZ1MZ1-6.35/11KV-3G95SAL	3 x 95	3.4	1.5	2.8	86.1	9800
RF7835-RHZ1MZ1-6.35/11KV-3G120SAL	3 x 120	3.4	1.6	3.0	90.0	10600
RF7835-RHZ1MZ1-6.35/11KV-3G150SAL	3 x 150	3.4	1.6	3.1	93.2	11350
RF7835-RHZ1MZ1-6.35/11KV-3G185SAL	3 x 185	3.4	1.7	3.2	97.5	12250
RF7835-RHZ1MZ1-6.35/11KV-3G240SAL	3 x 240	3.4	1.8	3.4	103.3	13700
RF7835-RHZ1MZ1-6.35/11KV-3G300SAL	3 x 300	3.4	1.9	3.6	108.8	15500
RF7835-RHZ1MZ1-6.35/11KV-3G400SAL	3 x 400	3.4	2.0	3.8	116.1	16750

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

12/20(24)KV Power Cables to CENELEC HD620 & C 33-226

Applications

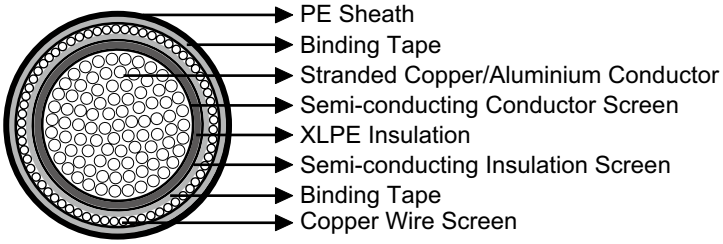
The cables are power cables for power networks, underground, outdoors and in cable ducting, in particular for installation where fire, smoke emission and toxic fumes create a potential threat.

Standard

- CENELEC HD 620
- C 33-226

Construction

- Conductor: Class 2 stranded plain copper / aluminium conductor to BS EN 60228:2005 (previously BS6360)
- Conductor Screen: Semi-conducting material
- Insulation: XLPE
- Insulation Screen: Semi-conducting material
- Metallic Screen: Copper wire screen
- Filler: PETP (Polyethylene Terephthalate) fibres
- Separator: Binding tape
- Sheath: PE.



Optional

Armoured Cables: Galvanized steel flat wire armoured cables can be offered as options.

Electrical Characteristics at 20□

Copper Conductor

Nominal Conductor Cross Section	mm^2	25	50	95	150	240	300	400	500	630
Maximum DC Conductor Resistance	Ω/km	0.727	0.387	0.193	0.124	0.0754	0.0601	0.047	0.0366	0.0283
Voltage Rating	KV	20								

Aluminium Conductor

Nominal Conductor Cross Section	mm^2	95	150	240	300	400	500	630
Maximum DC Conductor Resistance	Ω/km	0.32	0.206	0.125	0.1	0.0778	0.0605	0.0469
Voltage Rating	KV	20						

Mechanical and Thermal Properties

- Minimum Bending Radius: 15xOD (for single core cables); 12xOD(for three core cables)
- Temperature Range: 0℃ to +90℃ (during operation); 0℃ to +60℃ (during installation)

Dimensions and Weight

XKDT Single Core 12/20KV Copper Conductor

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF33226-XKDT-12/20KV-1G25SCU	1 x 25	7/2.14	5.5	1.8	27	740
RF33226-XKDT-12/20KV-1G50SCU	1 x 50	19/1.78	5.5	2.0	29	1120
RF33226-XKDT-12/20KV-1G95SCU	1 x 95	19/2.52	5.5	2.1	32	1640
RF33226-XKDT-12/20KV-1G150SCU	1 x 150	37/2.25	5.5	2.2	35	2320
RF33226-XKDT-12/20KV-1G240SCU	1 x 240	61/2.25	5.5	2.4	41	3360
RF33226-XKDT-12/20KV-1G300SCU	1 x 300	61/2.52	5.5	2.5	43	4060
RF33226-XKDT-12/20KV-1G400SCU	1 x 400	61/2.85	5.5	2.6	46	5040
RF33226-XKDT-12/20KV-1G500SCU	1 x 500	91/2.65	5.5	2.7	50	6150
RF33226-XKDT-12/20KV-1G630SCU	1 x 630	127/2.52	5.5	2.9	56	7830

XKDT-YT Three Core 12/20KV Copper Conductor

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF33226-XKDT-YT-12/20KV-3G25SCU	3 x 25	7/2.14	5.5	2.9	62	2740
RF33226-XKDT-YT-12/20KV-3G50SCU	3 x 50	19/1.78	5.5	3.0	65	3750
RF33226-XKDT-YT-12/20KV-3G95SCU	3 x 95	19/2.52	5.5	3.3	72	5330
RF33226-XKDT-YT-12/20KV-3G150SCU	3 x 150	37/2.25	5.5	3.5	79	7450
RF33226-XKDT-YT-12/20KV-3G240SCU	3 x 240	61/2.25	5.5	3.8	91	10670
RF33226-XKDT-YT-12/20KV-3G300SCU	3 x 300	61/2.52	5.5	4.0	98	13140

XKDT Single Core 12/20KV Aluminium Conductor

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF33226-XKDT-12/20KV-1G95SAL	1 x 95	19/2.52	5.5	2.1	32	970
RF33226-XKDT-12/20KV-1G150SAL	1 x 150	37/2.25	5.5	2.2	35	1310
RF33226-XKDT-12/20KV-1G240SAL	1 x 240	61/2.25	5.5	2.4	40	1830
RF33226-XKDT-12/20KV-1G300SAL	1 x 300	61/2.52	5.5	2.5	44	2140
RF33226-XKDT-12/20KV-1G400SAL	1 x 400	61/2.85	5.5	2.6	47	2480
RF33226-XKDT-12/20KV-1G500SAL	1 x 500	61/3.20	5.5	2.7	51	2920
RF33226-XKDT-12/20KV-1G630SAL	1 x 630	127/2.52	5.5	2.9	56	3580

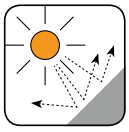
XKDT-YT Three Core 12/20KV Aluminium Conductor

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF33226-XKDT-YT-12/20KV-3G95SAL	3 x 95	19/2.52	5.5	3.3	72	3310

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
RF33226-XKDT-YT-12/20KV-3G150SAL	3 x 150	37/2.25	5.5	3.5	79	4360
RF33226-XKDT-YT-12/20KV-3G240SAL	3 x 240	61/2.25	5.5	3.8	90	6020
RF33226-XKDT-YT-12/20KV-3G300SAL	3 x 300	61/2.52	5.5	4.0	98	7000
RF33226-XKDT-YT-12/20KV-3G400SAL	3 x 400	61/2.85	5.5	4.3	106	8010

XKDT-FT Three Core 12/20KV Copper Conductor Galvanized Steel Flat Wire Armoured

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
				Inner	Outer		
RF33226-XKDT-FT-12/20KV-3G50SCU	3 x 50	19/1.78	5.5	1.6	3.0	72.9	7470
RF33226-XKDT-FT-12/20KV-3G95SCU	3 x 95	19/2.52	5.5	1.7	3.3	81.5	10100
RF33226-XKDT-FT-12/20KV-3G150SCU	3 x 150	37/2.25	5.5	1.8	3.5	89.1	12800
RF33226-XKDT-FT-12/20KV-3G240SCU	3 x 240	61/2.25	5.5	2.0	3.8	99.5	16850


UV Resistant


Water Resistant


Laid In Ducts


Buried in Ground

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

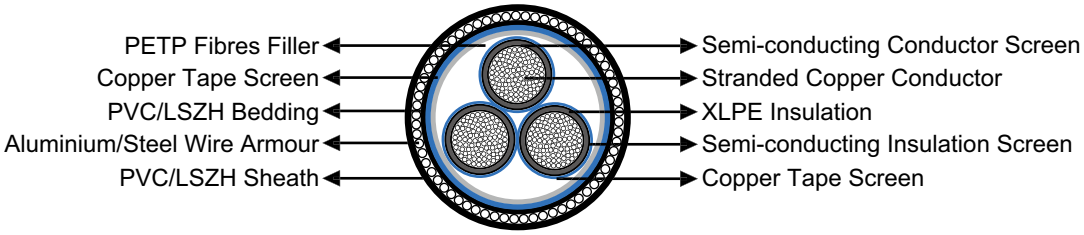
33KV LSZH Power Cables to BS 6622/BS 7835

Applications

The cables are power cables for power networks, underground, outdoors and in cable ducting.

Standard

- BS 6622 (PVC)
- BS 7835 (LSZH)



Construction

- Conductor: Class 2 stranded plain copper conductor to BS EN 60228:2005 (previously BS6360)
- Conductor Screen: Semi-conducting material
- Insulation: XLPE (Cross-Linked Polyethylene) Type GP8 to BS7655
- Insulation Screen: Semi-conducting material
- Metallic Screen: Individual and overall copper tape screen to BS6622
- Filler: PETP (Polyethylene Terephthalate) fibres
- Separator: Binding tape
- Bedding: PVC Type TM1 to BS7655 or LSZH
- Armour: Aluminium wire armoured (AWA) (for single core cables) or steel wire armoured (SWA) (for multicore cables)
- Sheath: PVC Type TM1 to BS7655 or LSZH.

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	50	70	95	120	150	185	240
Maximum DC Conductor Resistance	Ω/km	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754
Voltage Rating	KV	19/33						

（Continued）

Nominal Conductor Cross Section	mm^2	300	400	500	630	800	1000
Maximum DC Conductor Resistance	Ω/km	0.0601	0.047	0.0366	0.0283	0.0221	0.0176
Voltage Rating	KV	19/33					

Mechanical and Thermal Properties

- Minimum Bending Radius: 15xOD (for single core cables); 12xOD(for three core cables).
- Temperature Range: 0℃ to +90℃ (during operation); 0℃ to +60℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm		Nominal Overall Diameter mm	Nominal Weight kg/km
			Inner	Outer		
Copper Conductor						
RF6622-RHVMV-19/33KV-1G70SCU	1 x 70	8.0	1.2	2.2	41.0	2300
RF6622-RHVMV-19/33KV-1G95SCU	1 x 95	8.0	1.2	2.3	42.9	2650
RF6622-RHVMV-19/33KV-1G120SCU	1 x 120	8.0	1.2	2.3	44.5	3000
RF6622-RHVMV-19/33KV-1G150SCU	1 x 150	8.0	1.3	2.4	47.3	3500
RF6622-RHVMV-19/33KV-1G185SCU	1 x 185	8.0	1.3	2.5	49.3	4000
RF6622-RHVMV-19/33KV-1G240SCU	1 x 240	8.0	1.3	2.5	51.7	4650
RF6622-RHVMV-19/33KV-1G300SCU	1 x 300	8.0	1.4	2.6	54.4	5450
RF6622-RHVMV-19/33KV-1G400SCU	1 x 400	8.0	1.4	2.7	57.7	6350
RF6622-RHVMV-19/33KV-1G500SCU	1 x 500	8.0	1.5	2.8	61.1	7600
RF6622-RHVMV-19/33KV-1G630SCU	1 x 630	8.0	1.5	2.9	65.0	9150
RF6622-RHVMV-19/33KV-1G800SCU	1 x 800	8.0	1.6	3.0	71.6	11100
RF6622-RHVMV-19/33KV-1G1000SCU	1 x 1000	8.0	1.7	3.2	76.5	13400
RF6622-RHVMV-19/33KV-3G50SCU	3 x 50	8.0	1.8	3.4	78.2	9150
RF6622-RHVMV-19/33KV-3G70SCU	3 x 70	8.0	1.8	3.5	82.1	10300
RF6622-RHVMV-19/33KV-3G95SCU	3 x 95	8.0	1.9	3.6	86.1	11600
RF6622-RHVMV-19/33KV-3G120SCU	3 x 120	8.0	2.0	3.7	90.0	12800
RF6622-RHVMV-19/33KV-3G150SCU	3 x 150	8.0	2.0	3.8	93.2	14050
RF6622-RHVMV-19/33KV-3G185SCU	3 x 185	8.0	2.1	3.9	97.5	15650
RF6622-RHVMV-19/33KV-3G240SCU	3 x 240	8.0	2.2	4.1	103.3	18200
RF6622-RHVMV-19/33KV-3G300SCU	3 x 300	8.0	2.3	4.3	108.8	21100
RF6622-RHVMV-19/33KV-3G400SCU	3 x 400	8.0	2.4	4.5	116.1	24200
Aluminium Conductor						
RF6622-RHVMV-19/33KV-1G70SAL	1 x 70	8.0	1.2	2.2	41.0	1850
RF6622-RHVMV-19/33KV-1G95SAL	1 x 95	8.0	1.2	2.3	42.9	2100
RF6622-RHVMV-19/33KV-1G120SAL	1 x 120	8.0	1.2	2.3	44.5	2250
RF6622-RHVMV-19/33KV-1G150SAL	1 x 150	8.0	1.3	2.4	47.3	2600
RF6622-RHVMV-19/33KV-1G185SAL	1 x 185	8.0	1.3	2.5	49.3	2850
RF6622-RHVMV-19/33KV-1G240SAL	1 x 240	8.0	1.3	2.5	51.7	3150
RF6622-RHVMV-19/33KV-1G300SAL	1 x 300	8.0	1.4	2.6	54.4	3600
RF6622-RHVMV-19/33KV-1G400SAL	1 x 400	8.0	1.4	2.7	57.7	4000
RF6622-RHVMV-19/33KV-1G500SAL	1 x 500	8.0	1.5	2.8	61.1	4500
RF6622-RHVMV-19/33KV-1G630SAL	1 x 630	8.0	1.5	2.9	65.0	5250
RF6622-RHVMV-19/33KV-1G800SAL	1 x 800	8.0	1.6	3.0	71.6	6150
RF6622-RHVMV-19/33KV-1G1000SAL	1 x 1000	8.0	1.7	3.2	76.5	7200
RF6622-RHVMV-19/33KV-3G50SAL	3 x 50	8.0	1.8	3.4	78.2	8300
RF6622-RHVMV-19/33KV-3G70SAL	3 x 70	8.0	1.8	3.5	82.1	9050
RF6622-RHVMV-19/33KV-3G95SAL	3 x 95	8.0	1.9	3.6	86.1	9800
RF6622-RHVMV-19/33KV-3G120SAL	3 x 120	8.0	2.0	3.7	90.0	10600
RF6622-RHVMV-19/33KV-3G150SAL	3 x 150	8.0	2.0	3.8	93.2	11350
RF6622-RHVMV-19/33KV-3G185SAL	3 x 185	8.0	2.1	3.9	97.5	12250
RF6622-RHVMV-19/33KV-3G240SAL	3 x 240	8.0	2.2	4.1	103.3	13700
RF6622-RHVMV-19/33KV-3G300SAL	3 x 300	8.0	2.3	4.3	108.8	15500
RF6622-RHVMV-19/33KV-3G400SAL	3 x 400	8.0	2.4	4.5	116.1	16750

PVC Sheath

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

LSZH Sheath

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

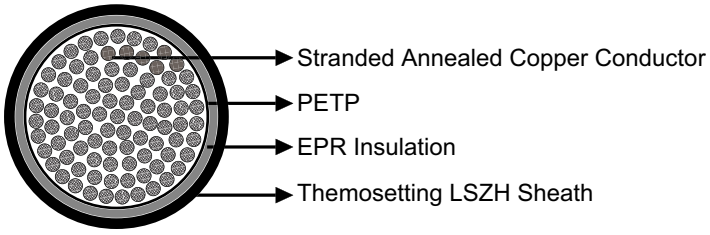
1800V DC Positive Traction Cables

Applications

These DC power cables are used for urban railways for 1800V DC traction power system with feedback current and return current, suitable for fixed installation. The cables are suitable for installations in ducts, tunnels, and cable troughs or on the cable bridges etc.

Standard

- NR-PS-ELP-21101
- IEC60502-1
- BS 6883



Fire Performance

- IEC60332-3-22
- IEC60754-1, IEC60754-2
- IEC61034-1, IEC61034-2

Construction

- Conductor: Stranded annealed bare or metal coated copper conductors to BS EN 60228:2005 (previously BS6360).
- Core wrapping: PETP (Polyethylene Terephthalate).
- Insulation: EPR, GP4 to BS 7655-1.2 (formerly BS6889 GP2)
- Sheath: Thermosetting LSZH compound SW4 to BS 7655-2.6 (formerly BS 7655-2.5 LRS1)with enhanced oil resistance, and minimum tear resistance.

Electrical Characteristics at 20℃

Nominal Conductor Cross Section	mm^2	70	95	120	150	185	240	300	400	500
Assigned Continuous Current Rating	A	330	400	464	530	612	648	853	1010	1195
Conductor Short Circuit Current 1s	kA	10.0	13.5	17.1	21.4	26.4	34.3	42.9	57.2	71.5
Voltage Rating	KV	1.8								

Mechanical and Thermal Properties

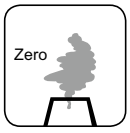
- Minimum Bending Radius: 8 x OD
- Temperature Range: -40℃ to +90℃ (during operation); -25℃ to +60℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm²	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km Diameter mm	Max. Resistance of Conductor at 20℃/Ω/Km	
							Plain Wires	Metal Coated Wires
Class 2 Conductor								
RF6883-DZ1-U-1800P-1G70S	1 x 70	19/2.14	2.2	1.8	18.3	921	0.268	0.270
RF6883-DZ1-U-1800P-1G95S	1 x 95	19/2.52	2.4	1.8	18.7	934	0.193	0.195
RF6883-DZ1-U-1800P-1G120S	1 x 120	37/2.03	2.4	1.8	22.6	1529	0.153	0.154
RF6883-DZ1-U-1800P-1G150S	1 x 150	37/2.25	2.4	1.8	24.2	1828	0.124	0.126
RF6883-DZ1-U-1800P-1G185S	1 x 185	37/2.52	2.4	1.8	26.0	2233	0.0991	0.100
RF6883-DZ1-U-1800P-1G240S	1 x 240	61/2.25	2.4	1.8	28.7	2856	0.0754	0.0762
RF6883-DZ1-U-1800P-1G300S	1 x 300	61/2.52	2.4	2.0	31.5	3848	0.0601	0.0607
RF6883-DZ1-U-1800P-1G400S	1 x 400	61/2.85	2.6	2.1	35.1	4491	0.0470	0.0475
RF6883-DZ1-U-1800P-1G500S	1 x 500	91/2.65	2.8	2.9	40.2	5773	0.0366	0.0369
RF6883-DZ1-U-1800P-1G630S	1 x 630	127/2.52	2.8	2.9	44.2	7293	0.0283	0.0286
RF6883-DZ1-U-1800P-1G800S	1 x 800	127/2.85	2.8	2.9	48.5	9157	0.0221	0.0224
Class 5 Conductor								
RF6883-DZ1-K-1800P-1G70S	1 x 70	360/0.5	2.2	1.8	18.3	921	0.272	0.277
RF6883-DZ1-K-1800P-1G95S	1 x 95	475/0.5	2.4	1.8	18.7	934	0.206	0.210
RF6883-DZ1-K-1800P-1G120S	1 x 120	608/0.5	2.4	1.8	22.6	1529	0.161	0.164
RF6883-DZ1-K-1800P-1G150S	1 x 150	756/0.5	2.4	1.8	24.2	1828	0.129	0.132
RF6883-DZ1-K-1800P-1G185S	1 x 185	925/0.5	2.4	1.8	26.0	2233	0.106	0.108
RF6883-DZ1-K-1800P-1G240S	1 x 240	1221/0.5	2.4	1.8	28.7	2856	0.0801	0.0817
RF6883-DZ1-K-1800P-1G300S	1 x 300	1525/0.5	2.4	2.0	31.5	3848	0.0641	0.0654
RF6883-DZ1-K-1800P-1G400S	1 x 400	2013/0.5	2.6	2.1	35.1	4491	0.0486	0.0495
RF6883-DZ1-K-1800P-1G500S	1 x 500	1769/0.6	2.8	2.9	40.2	5773	0.0384	0.0391
RF6883-DZ1-K-1800P-1G630S	1 x 630	2257/0.6	2.8	2.9	44.2	7293	0.0287	0.0292

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

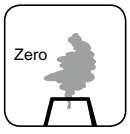
Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

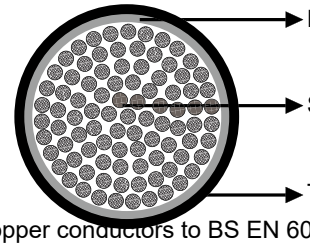
300V DC Negative Traction Cables

Applications

These DC power cables are used for urban railways for 1500V DC traction power system with feedback current and return current, suitable for fixed installation. The cables are suitable for installations in ducts, tunnels, and cable troughs or on the cable bridges etc.

Standard

- IEC60092
- BS7655
- IEC60502
- IEC60332-3
- IEC60754-2
- IEC61034
- BS 6883 Type 657 SW4



Construction

- Conductor: Class 2 stranded annealed bare copper conductors to BS EN 60228:2005 (previously BS6360).
- Core wrapping: PETP (Polyethylene Terephthalate).
- Sheath: Thermosetting LSZH compound SW4 to BS7655 / ICEA T- T-33-655 with enhanced oil resistance, and minimum tear resistance.

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	70	95	120	150	185	240	300	400	500
Maximum DC Conductor Resistance	Ω/km	0.277	0.21	0.164	0.132	0.108	0.0817	0.0654	0.0495	0.0391
Minimum Insulation Resistance	MΩ.km	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Conductor Short Circuit Current 1s	kA	10.0	13.5	17.1	21.4	26.4	34.3	42.9	57.2	71.5
Voltage Rating	KV	0.3								

Mechanical and Thermal Properties

- Minimum Bending Radius: 6 x OD
- Temperature Range: -40℃ to +90℃ (during operation); -25℃ to +60℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	No. & Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km	Polarity
RF6883-ES05Z1-U-300N-1G70S	1 x 70	19/2.14	4.0	19.4	1055	Negative
RF6883-ES05Z1-U-300N-1G95S	1 x 95	19/2.52	4.0	20.7	1307	Negative
RF6883-ES05Z1-U-300N-1G120S	1 x 120	37/2.03	4.0	22.6	1598	Negative
RF6883-ES05Z1-U-300N-1G150S	1 x 150	37/2.25	4.0	24.3	1913	Negative
RF6883-ES05Z1-U-300N-1G185S	1 x 185	37/2.52	4.0	26.3	2274	Negative
RF6883-ES05Z1-U-300N-1G240S	1 x 240	61/2.25	4.0	29.1	2893	Negative
RF6883-ES05Z1-U-300N-1G300S	1 x 300	61/2.52	4.0	32.3	3530	Negative
RF6883-ES05Z1-U-300N-1G400S	1 x 400	61/2.85	4.0	36.3	4532	Negative
RF6883-ES05Z1-U-300N-1G500S	1 x 500	91/2.65	4.0	40.3	5684	Negative
RF6883-ES05Z1-U-300N-1G630S	1 x 630	127/2.52	4.0	42.3	6400	Negative
RF6883-ES05Z1-U-300N-1G800S	1 x 800	127/2.85	4.0	46.5	8094	Negative

Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

FIRERAIL TRACTION CABLES FOR RAILWAY APPLICATIONS

0.45/0.75KV Single Core Standard Wall Traction Cables

Applications

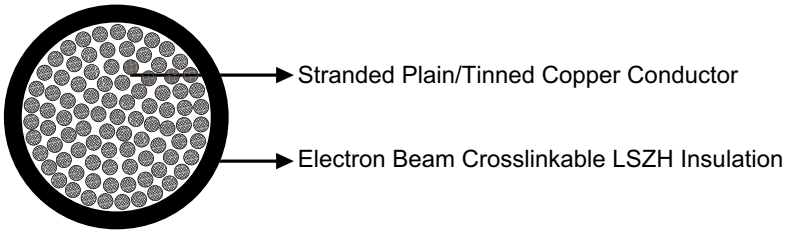
Single core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts.

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0

Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation: Electron beam crosslinkable standard wall LSZH compound



Optional

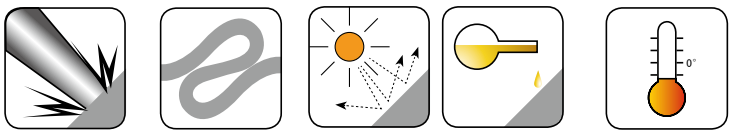
FRA-SW-0.75S (Sheathed); FRA-SW-0.75S-OS (Screened & sheathed)
FRA-SW-0.75SU-FR (Fire resistant & Unsheathed)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.0	1.5	2.5	4.0	6.0	10	16
Maximum Conductor Resistance	Ω/km	20	13.7	8.21	5.09	3.39	1.95	1.24
Voltage Rating	KV	0.45/0.75						

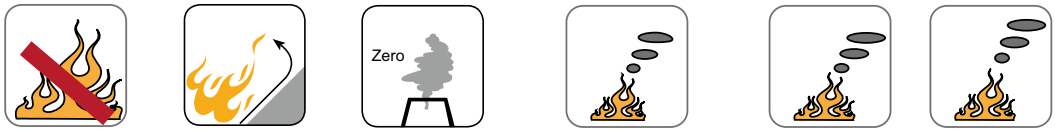
Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃



Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-SW-0.75SU-1C1S	1 x 1.0	32/0.2	0.8	3.9	28
FRA-SW-0.75SU-1C1.5S	1 x 1.5	30/0.25	0.8	4.2	34
FRA-SW-0.75SU-1C2.5S	1 x 2.5	50/0.25	0.8	4.6	41
FRA-SW-0.75SU-1C4S	1 x 4.0	56/0.3	0.8	5.2	64
FRA-SW-0.75SU-1C6S	1 x 6.0	84/0.3	0.9	6.4	93
FRA-SW-0.75SU-1C10S	1 x 10.0	80/0.4	0.9	7.5	141
FRA-SW-0.75SU-1C16S	1 x 16.0	126/0.4	1.1	8.6	203



Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

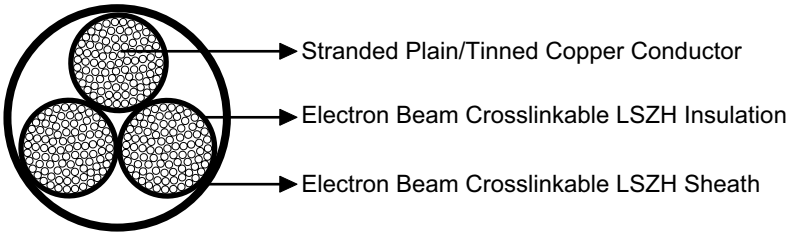
0.45/0.75KV Multicore Standard Wall Traction Cables

Applications

Multicore power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts.

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0



Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360
- Insulation: Electron beam crosslinkable standard wall LSZH compound
- Outer sheath: Electron beam crosslinkable LSZH compound

Optional

FRA-SW-0.75M-OS (Screened);
FRA-SW-0.75M-FR (Fire resistant)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.0	1.5	2.5	4.0	6.0	10	16
Maximum Conductor Resistance	Ω/km	20	13.7	8.21	5.09	3.39	1.95	1.24
Voltage Rating	KV	0.45/0.75						

Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

Dimensions and Weight

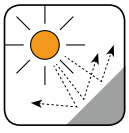
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-SW-0.75M-2C1.5S	2 x 1.5	30/0.25	0.7	8.9	127
FRA-SW-0.75M-3C1.5S	3 x 1.5	30/0.25	0.7	9.6	144

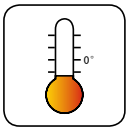
FIRERAIL TRACTION CABLES FOR RAILWAY APPLICATIONS

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-SW-0.75M-4C1.5S	4 x 1.5	30/0.25	0.7	10.6	177
FRA-SW-0.75M-5C1.5S	5 x 1.5	30/0.25	0.7	11.6	186
FRA-SW-0.75M-7C1.5S	7 x 1.5	30/0.25	0.7	12.5	243
FRA-SW-0.75M-13C1.5S	13 x 1.5	30/0.25	0.7	17.0	411
FRA-SW-0.75M-19C1.5S	19 x 1.5	30/0.25	0.7	19.3	586
FRA-SW-0.75M-28C1.5S	28 x 1.5	30/0.25	0.7	23.6	901
FRA-SW-0.75M-37C1.5S	37 x 1.5	30/0.25	0.7	26.6	1068
FRA-SW-0.75M-2C2.5S	2 x 2.5	50/0.25	0.8	10.3	166
FRA-SW-0.75M-3C2.5S	3 x 2.5	50/0.25	0.8	11.1	201
FRA-SW-0.75M-4C2.5S	4 x 2.5	50/0.25	0.8	12.3	252
FRA-SW-0.75M-5C2.5S	5 x 2.5	50/0.25	0.8	13.4	282
FRA-SW-0.75M-7C2.5S	7 x 2.5	50/0.25	0.8	14.6	345
FRA-SW-0.75M-13C2.5S	13 x 2.5	50/0.25	0.8	20.0	616
FRA-SW-0.75M-19C2.5S	19 x 2.5	50/0.25	0.8	22.8	806
FRA-SW-0.75M-28C2.5S	28 x 2.5	50/0.25	0.8	28.2	1236
FRA-SW-0.75M-37C2.5S	37 x 2.5	50/0.25	0.8	31.7	1650


Impact Resistant


Highly Flexible

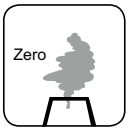

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

0.45/0.75KV Single Core Thin Wall Traction Cables

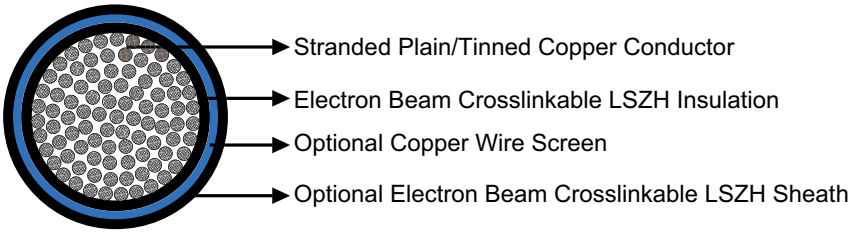
Applications

Single core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts.

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0

Construction



- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation: Electron beam crosslinkable thin wall LSZH compound
- Screening(optional): Copper Wire Screen (for screened & sheathed cables)
- Outer sheath(optional): Electron beam crosslinkable LSZH compound (for screened & sheathed cables)

Optional

FRA-TW-0.75S (Sheathed)

FRA-TW-0.75SU-FR (Fire resistant & Unsheathed)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	AWG	20	18	16	14	12	10
Maximum Conductor Resistance	Ω/km	28.3	17.9	14.1	8.3	6.8	3.6
Voltage Rating	KV	0.45/0.75					

Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

Dimensions and Weight

FRA-TW-0.75SU (Unsheathed)

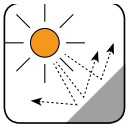
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x AWG	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-0.75SU-1C20A	1 x 20	19/0.2	0.18	1.5	7
FRA-TW-0.75SU-1C18A	1 x 18	19/0.25	0.18	1.75	10
FRA-TW-0.75SU-1C16A	1 x 16	19/0.3	0.18	2.0	14
FRA-TW-0.75SU-1C14A	1 x 14	37/0.25	0.22	2.35	19
FRA-TW-0.75SU-1C12A	1 x 12	37/0.3	0.28	2.77	28
FRA-TW-0.75SU-1C10A	1 x 10	37/0.4	0.34	3.45	47

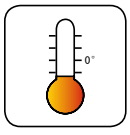
FRA-TW-0.75S-OS (Screened & Sheath)

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x AWG	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-0.75S-OS-1C20A	1 x 20	19/0.2	0.18	2.5	17
FRA-TW-0.75S-OS-1C18A	1 x 18	19/0.25	0.18	2.7	19.4
FRA-TW-0.75S-OS-1C16A	1 x 16	19/0.3	0.18	2.9	24.2


Impact Resistant


Highly Flexible

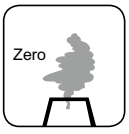

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

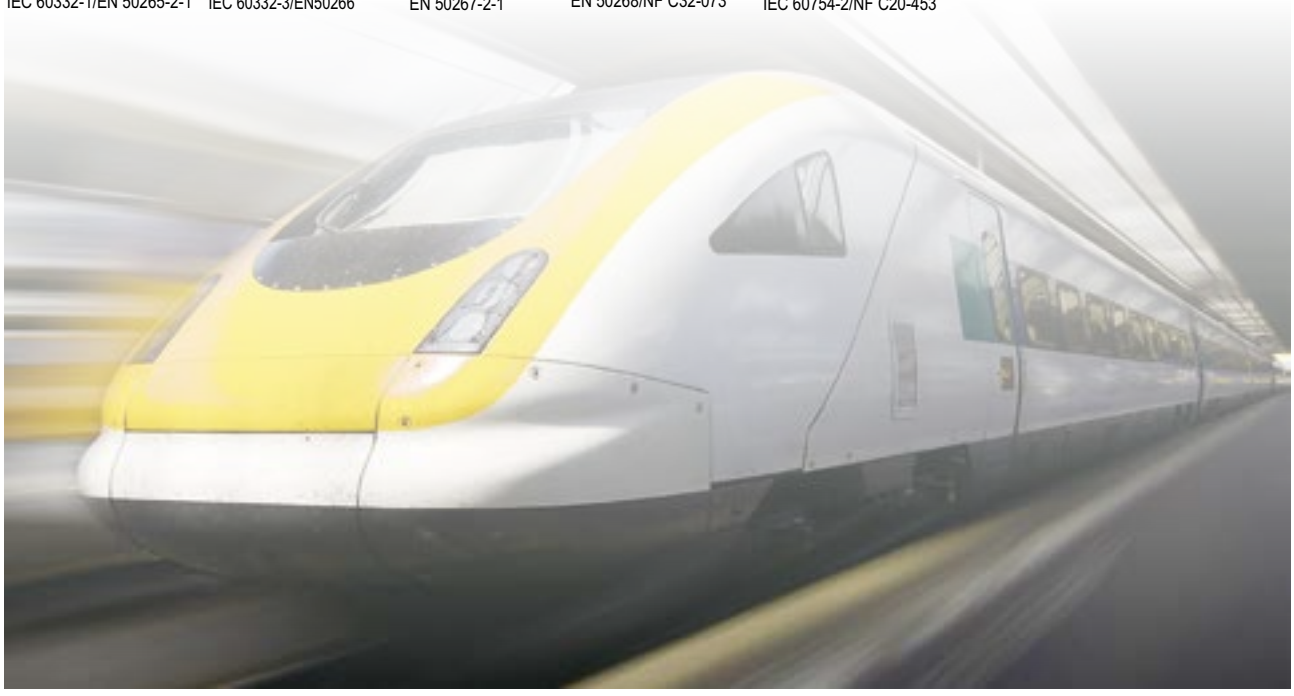


Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity



0.45/0.75KV Multicore Thin Wall Traction Cables

Applications

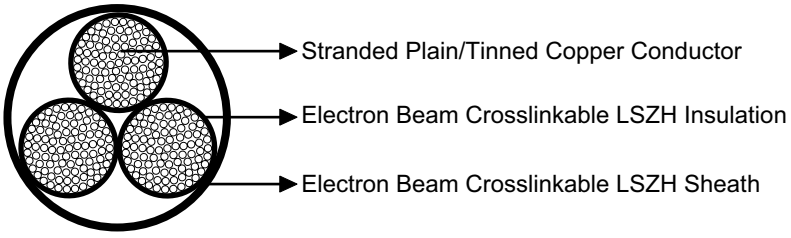
Multicore power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts.

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0

Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360
- Insulation: Electron beam crosslinkable thin wall LSZH compound
- Outer sheath: Electron beam crosslinkable LSZH compound



Optional

FRA-TW-0.75M-OS (Screened);
FRA-TW-0.75M-FR (Fire resistant)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	AWG	20	18	16	14	12	10
Maximum Conductor Resistance	Ω/km	28.3	17.9	14.1	8.3	6.8	3.6
Voltage Rating	KV	0.45/0.75					

Mechanical and Thermal Properties

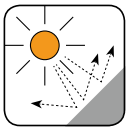
- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

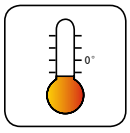
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x AWG	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-0.75M-2C20A	2 x 20	19/0.2	0.18	4.2	32
FRA-TW-0.75M-2C18A	2 x 18	19/0.25	0.18	4.6	39
FRA-TW-0.75M-2C16A	2 x 16	19/0.3	0.18	5.3	54
FRA-TW-0.75M-2C14A	2 x 14	37/0.25	0.22	6.1	66
FRA-TW-0.75M-2C12A	2 x 12	37/0.3	0.28	7.3	92
FRA-TW-0.75M-3C20A	3 x 20	19/0.2	0.18	4.4	46
FRA-TW-0.75M-3C18A	3 x 18	19/0.25	0.18	4.95	62
FRA-TW-0.75M-4C20A	4 x 20	19/0.2	0.18	4.65	59
FRA-TW-0.75M-4C18A	4 x 18	19/0.25	0.18	5.2	80
FRA-TW-0.75M-4C16A	4 x 16	19/0.3	0.18	6.0	104


Impact Resistant


Highly Flexible

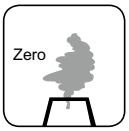

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

0.6/1KV Single Core Medium Wall Traction Cables

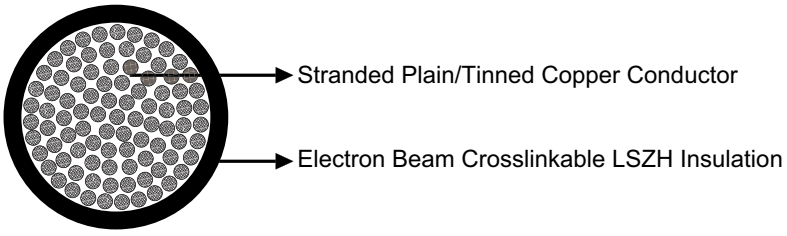
Applications

Single Core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts.

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0

Construction



- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation: Electron beam crosslinkable medium wall LSZH compound

Optional

FRA-MW-1S (Sheathed); FRA-MW-1S-OS (Screened & Sheathed)
FRA-MW-1SU-FR (Fire resistant & Unsheathed)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	0.5	0.75	1.0	1.5	2.5	4.0	6.0
Maximum Conductor Resistance	Ω/km	40.1	26.7	20.0	13.7	8.21	5.09	3.39
Voltage Rating	KV	0.6/1.0						

Nominal Conductor Cross Section	mm^2	10	16	25	35	50	70	95
Maximum Conductor Resistance	Ω/km	1.95	1.24	0.795	0.565	0.393	0.277	0.21
Voltage Rating	KV	0.6/1.0						

Nominal Conductor Cross Section	mm^2	120	150	185	240	300	400
Maximum Conductor Resistance	Ω/km	0.164	0.132	0.108	0.0817	0.0654	0.0495
Voltage Rating	KV	0.6/1.0					

Mechanical and Thermal Properties

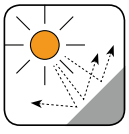
- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

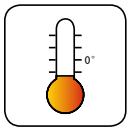
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-MW-1SU-1C0.5S	1 x 0.5	16/0.2	0.6	2.0	6
FRA-MW-1SU-1C0.75S	1 x 0.75	24/0.2	0.6	2.2	8
FRA-MW-1SU-1C1S	1 x 1.0	32/0.2	0.6	2.6	10
FRA-MW-1SU-1C1.5S	1 x 1.5	30/0.25	0.7	3.1	20
FRA-MW-1SU-1C2.5S	1 x 2.5	50/0.25	0.7	3.5	30
FRA-MW-1SU-1C4S	1 x 4.0	56/0.3	0.7	4.1	50
FRA-MW-1SU-1C6S	1 x 6.0	84/0.3	0.7	4.6	60
FRA-MW-1SU-1C10S	1 x 10	80/0.4	0.7	5.5	110
FRA-MW-1SU-1C16S	1 x 16	126/0.4	0.7	6.7	160
FRA-MW-1SU-1C25S	1 x 25	196/0.40	0.9	8.5	240
FRA-MW-1SU-1C35S	1 x 35	276/0.40	0.9	9.8	330
FRA-MW-1SU-1C50S	1 x 50	396/0.40	1.0	11.5	460
FRA-MW-1SU-1C70S	1 x 70	360/0.50	1.0	13.6	660
FRA-MW-1SU-1C95S	1 x 95	475/0.50	1.1	15.1	860
FRA-MW-1SU-1C120S	1 x 120	608/0.50	1.1	17.1	1080
FRA-MW-1SU-1C150S	1 x 150	756/0.50	1.4	19.1	1370
FRA-MW-1SU-1C185S	1 x 185	925/0.50	1.6	21.3	1690
FRA-MW-1SU-1C240S	1 x 240	1221/0.50	1.7	24.1	2230
FRA-MW-1SU-1C300S	1 x 300	1525/0.50	1.8	26.7	2780
FRA-MW-1SU-1C400S	1 x 400	2013/0.50	2.0	30.5	3740


Impact Resistant


Highly Flexible

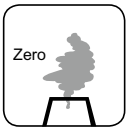

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

0.6/1KV Multicore Medium Wall Traction Cables

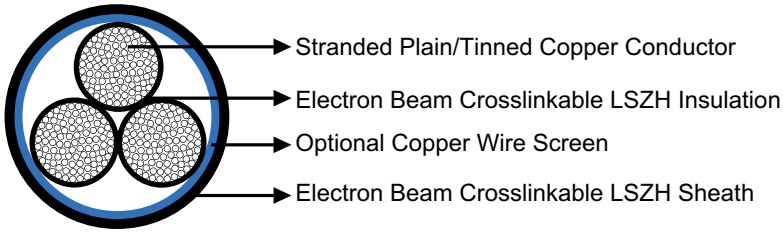
Applications

Multicore power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts.

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0

Construction



- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation: Electron beam crosslinkable medium wall LSZH compound
- Screening (optional) : Copper Wire Screen(for screened cables)
- Outer sheath: Electron beam crosslinkable LSZH compound

Optional

FRA-MW-1M-FR (Fire resistant multicore)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	0.5	0.75	1.0	1.5	2.5	4.0	6.0
Maximum Conductor Resistance	Ω/km	40.1	26.7	20.0	13.7	8.21	5.09	3.39
Voltage Rating	KV	0.6/1.0						

Nominal Conductor Cross Section	mm^2	10	16	25	35	50
Maximum Conductor Resistance	Ω/km	1.95	1.24	0.795	0.565	0.393
Voltage Rating	KV	0.6/1.0				

Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

↘ Dimensions and Weight

FRA-MW-1M (Multicore unscreened)

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-MW-1M-2C0.5S	2 x 0.5	16/0.20	0.6	5.9	48
FRA-MW-1M-4C0.5S	4 x 0.5	16/0.20	0.6	7.0	55
FRA-MW-1M-7C0.5S	7 x 0.5	16/0.20	0.6	9.1	72
FRA-MW-1M-18C0.5S	18 x 0.5	16/0.20	0.6	12.7	86
FRA-MW-1M-3C0.75S	3 x 0.75	24/0.20	0.6	6.8	70
FRA-MW-1M-5C0.75S	5 x 0.75	24/0.20	0.6	8.4	107
FRA-MW-1M-8C0.75S	8 x 0.75	24/0.20	0.6	10.9	147
FRA-MW-1M-12C0.75S	12 x 0.75	24/0.20	0.6	11.9	175
FRA-MW-1M-20C0.75S	20 x 0.75	24/0.20	0.6	15.2	350
FRA-MW-1M-2C1S	2 x 1.0	32/0.20	0.6	6.9	72
FRA-MW-1M-6C1S	6 x 1.0	32/0.20	0.6	10.0	160
FRA-MW-1M-9C1S	9 x 1.0	32/0.20	0.6	12.5	210
FRA-MW-1M-25C1S	25 x 1.0	32/0.20	0.6	18.7	519
FRA-MW-1M-2C1.5S	2 x 1.5	30/0.25	0.7	7.5	86
FRA-MW-1M-3C1.5S	3 x 1.5	30/0.25	0.7	8.0	90
FRA-MW-1M-5C1.5S	5 x 1.5	30/0.25	0.7	10.2	169
FRA-MW-1M-7C1.5S	**7G 1.5	30/0.25	0.7	12.1	238
FRA-MW-1M-12C1.5S	12 x 1.5	30/0.25	0.7	14.2	313
FRA-MW-1M-36C1.5S	36 x 1.5	30/0.25	0.7	23	905

**G—yellow/green

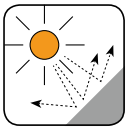
FRA-MW-1M-OS (Multicore screened)

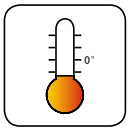
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-MW-1M-OS-2C0.5S	2 x 0.5	16/0.20	0.6	6.6	68
FRA-MW-1M-OS-4C0.5S	4 x 0.5	16/0.20	0.6	7.5	102
FRA-MW-1M-OS-7C0.5S	7 x 0.5	16/0.20	0.6	9.8	145
FRA-MW-1M-OS-15C0.5S	15 x 0.5	16/0.20	0.6	13.4	240
FRA-MW-1M-OS-9P0.5S	9 x 2 x 0.5	16/0.20	0.6	20.6	541
FRA-MW-1M-OS-3C0.75S	3 x 0.75	24/0.20	0.6	7.5	94
FRA-MW-1M-OS-6C0.75S	6 x 0.75	24/0.20	0.6	9.9	165
FRA-MW-1M-OS-9C0.75S	9 x 0.75	24/0.20	0.6	12.3	243
FRA-MW-1M-OS-16C0.75S	16 x 0.75	24/0.20	0.6	14.4	348
FRA-MW-1M-OS-5P0.75S	5 x 2 x 0.75	24/0.20	0.6	16.0	354
FRA-MW-1M-OS-4C1S	4 x 1.0	32/0.20	0.6	8.8	140
FRA-MW-1M-OS-7C1S	7 x 1.0	32/0.20	0.6	11.8	226
FRA-MW-1M-OS-3C1.5S	3 x 1.5	32/0.25	0.7	8.6	124
FRA-MW-1M-OS-5C1.5S	5 x 1.5	32/0.25	0.7	10.9	208
FRA-MW-1M-OS-9C1.5S	9 x 1.5	30/0.25	0.7	14.9	409
FRA-MW-1M-OS-16C1.5S	16 x 1.5	30/0.25	0.7	17.5	560
FRA-MW-1M-OS-6P1.5S	6 x 2 x 1.5	30/0.25	0.7	18.9	540
FRA-MW-1M-OS-2C2.5S	2 x 2.5	50/0.25	0.7	9.6	160
FRA-MW-1M-OS-4C2.5S	4 x 2.5	50/0.25	0.7	11.3	222
FRA-MW-1M-OS-7C2.5S	7 x 2.5	50/0.25	0.7	14.8	400
FRA-MW-1M-OS-3C4S	3 x 4	56/0.30	0.7	11.8	260
FRA-MW-1M-OS-5C4S	5 x 4	56/0.30	0.7	14.7	440
FRA-MW-1M-OS-3C6S	3 x 6	84/0.30	0.7	13.8	370
FRA-MW-1M-OS-5C6S	5 x 6	84/0.30	0.7	17.4	620
FRA-MW-1M-OS-3C10S	3 x 10	80/0.40	0.7	17.1	580

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-MW-1M-OS-4C10S	4 x 10	80/0.40	0.7	19.2	750
FRA-MW-1M-OS-5C10S	5 x 10	80/0.40	0.7	21.1	850
FRA-MW-1M-OS-3C16S	3 x 16	126/0.40	0.7	20.5	820
FRA-MW-1M-OS-2C25S	2 x 25	196/0.40	0.9	22.9	990
FRA-MW-1M-OS-3C35S	3 x 35	276/0.40	0.9	27.9	1600
FRA-MW-1M-OS-6C35S	6 x 35	276/0.40	0.9	39.7	3390
FRA-MW-1M-OS-2C50S	2 x 50	396/0.40	1.0	29.8	1760


Impact Resistant


Highly Flexible


UV Resistant

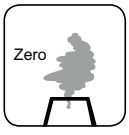


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

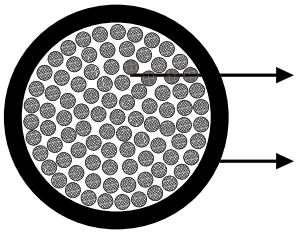
0.6/1KV Single Core Thin Wall Traction Cables

Applications

Single core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts.

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0



Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation: Electron beam crosslinkable thin wall LSZH compound

Optional

FRA-TW-1SU-FR (Fire resistant & Unsheathed)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	0.5	0.6	0.75	1.0	1.2	1.5	2.0	2.5	4.0
Maximum Conductor Resistance	Ω/km	40.1	33.4	26.7	20	16.3	13.7	11.2	8.21	5.09
Voltage Rating	KV	0.6/1.0								

Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

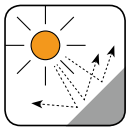
Dimensions and Weight

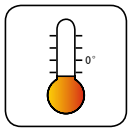
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-1SU-1C0.5S	1 x 0.5	19/0.18	0.3	1.4	5.8
FRA-TW-1SU-1C0.6S	1 x 0.6	19/0.20	0.3	1.5	7

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-1SU-1C0.75S	1 x 0.75	19/0.22	0.3	1.6	8.4
FRA-TW-1SU-1C1S	1 x 1.0	19/0.26	0.3	1.75	10
FRA-TW-1SU-1C1.2S	1 x 1.2	19/0.28	0.3	2.0	13
FRA-TW-1SU-1C1.5S	1 x 1.5	19/0.30	0.3	2.15	16
FRA-TW-1SU-1C2S	1 x 2.0	37/0.25	0.4	2.4	19
FRA-TW-1SU-1C2.5S	1 x 2.5	19/0.40	0.4	2.75	26
FRA-TW-1SU-1C4S	1 x 4.0	56/0.30	0.4	3.35	40


Impact Resistant


Highly Flexible

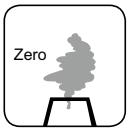

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

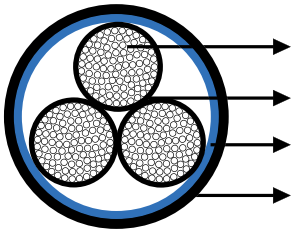
0.6/1KV Multicore Thin Wall Traction Cables

Applications

Multicore power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts.

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0



Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation: Electron beam crosslinkable thin wall LSZH compound
- Screen(optional): Copper Wire Screen (for screened cable)
- Outer sheath: Electron beam crosslinkable LSZH compound.

Optional

FRA-TW-1M (Fire resistant)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	0.5	0.75	1.0	1.5	2.5
Maximum Conductor Resistance	Ω/km	40.1	26.7	20	13.7	8.21
Voltage Rating	KV	0.6/1.0				

Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

Dimensions and Weight

FRA-TW-1M (Multicore unscreened)

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-1M-2C0.5S	2 x 0.5	19/0.18	0.3	4.4	31

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-1M-3C0.5S	3 x 0.5	19/0.18	0.3	4.6	36
FRA-TW-1M-4C0.5S	4 x 0.5	19/0.18	0.3	5.0	43
FRA-TW-1M-5C0.5S	5 x 0.5	19/0.18	0.3	5.5	53
FRA-TW-1M-6C0.5S	6 x 0.5	19/0.18	0.3	6.0	62
FRA-TW-1M-2P0.5S	2 x 2 x 0.5	19/0.18	0.3	6.5	58
FRA-TW-1M-4P0.5S	4 x 2 x 0.5	19/0.18	0.3	8.7	99
FRA-TW-1M-2C0.75S	2 x 0.75	19/0.22	0.3	4.75	35
FRA-TW-1M-3C0.75S	3 x 0.75	19/0.22	0.3	5.15	47
FRA-TW-1M-4C0.75S	4 x 0.75	19/0.22	0.3	5.6	57
FRA-TW-1M-6C0.75S	6 x 0.75	19/0.22	0.3	6.75	83
FRA-TW-1M-2P0.75S	2 x 2 x 0.75	19/0.22	0.3	7.75	81
FRA-TW-1M-2C1S	2 x 1.0	19/0.25	0.3	5.1	45
FRA-TW-1M-3C1S	3 x 1.0	19/0.25	0.3	5.4	54
FRA-TW-1M-4C1S	4 x 1.0	19/0.25	0.3	5.8	64
FRA-TW-1M-6C1S	6 x 1.0	19/0.25	0.3	7.3	98
FRA-TW-1M-10C1S	10 x 1.0	19/0.25	0.3	8.7	143
FRA-TW-1M-25C1S	25 x 1.0	19/0.25	0.3	12.8	324
FRA-TW-1M-2C1.5S	2 x 1.5	19/0.3	0.3	6.0	63
FRA-TW-1M-3C1.5S	3 x 1.5*	19/0.3	0.3	6.3	76
FRA-TW-1M-4C1.5S	4 x 1.5	19/0.3	0.3	6.9	94
FRA-TW-1M-5C1.5S	5 x 1.5*	19/0.3	0.3	7.8	116
FRA-TW-1M-6C1.5S	6 x 1.5	19/0.3	0.3	8.45	141
FRA-TW-1M-7C1.5S	7G 1.5	19/0.3	0.3	9.1	165
FRA-TW-1M-8C1.5S	8 x 1.5	19/0.3	0.3	10.3	201
FRA-TW-1M-10C1.5S	10 x 1.5	19/0.3	0.3	10.6	216
FRA-TW-1M-18C1.5S	18 x 1.5	19/0.3	0.3	13.4	374
FRA-TW-1M-25C1.5S	25G 1.5	19/0.3	0.3	15.5	494
FRA-TW-1M-2C2.5S	2 x 2.5	19/0.4	0.4	7.3	98
FRA-TW-1M-3C2.5S	3 x 2.5*	19/0.4	0.4	7.8	122
FRA-TW-1M-4C2.5S	4 x 2.5	19/0.4	0.4	8.7	152
FRA-TW-1M-5C2.5S	5 x 2.5	19/0.4	0.4	9.4	181
FRA-TW-1M-6C2.5S	6 x 2.5	19/0.4	0.4	10.6	223

*earth cable can be offered as an option

G:earth cable (yellow/green)

FRA-TW-1M-OS (Multicore screened)

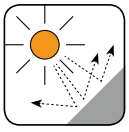
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-1M-OS-2C0.5S	2 x 0.5	19/0.18	0.3	4.8	42
FRA-TW-1M-OS-3C0.5S	3 x 0.5	19/0.18	0.3	5.3	51
FRA-TW-1M-OS-4C0.5S	4 x 0.5	19/0.18	0.3	5.4	56
FRA-TW-1M-OS-6C0.5S	6 x 0.5	19/0.18	0.3	6.5	82
FRA-TW-1M-OS-15C0.5S	15 x 0.5	19/0.18	0.3	9.0	167
FRA-TW-1M-OS-2P0.5S	2 x 2 x 0.5	19/0.18	0.3	7.2	80
FRA-TW-1M-OS-3P0.5S	3 x 2 x 0.5	19/0.18	0.3	8.1	98
FRA-TW-1M-OS-4P0.5S	4 x 2 x 0.5	19/0.18	0.3	9.3	131
FRA-TW-1M-OS-12P0.5S	12 x 2 x 0.5	19/0.18	0.3	13.0	276
FRA-TW-1M-OS-2C0.75S	2 x 0.75	19/0.22	0.3	5.0	48
FRA-TW-1M-OS-4C0.75S	4 x 0.75	19/0.22	0.3	6.0	72
FRA-TW-1M-OS-6C0.75S	6 x 0.75	19/0.22	0.3	7.2	103
FRA-TW-1M-OS-10C0.75S	10 x 0.75	19/0.22	0.3	8.7	152

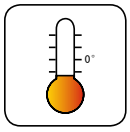
FIRERAIL TRACTION CABLES FOR RAILWAY APPLICATIONS

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-1M-OS-18C0.75S	18 x 0.75	19/0.22	0.3	11.0	244
FRA-TW-1M-OS-3P0.75S	3 x 2 x 0.75	19/0.22	0.3	9.0	127
FRA-TW-1M-OS-2C1S	2 x 1.0	19/0.25	0.3	5.6	60
FRA-TW-1M-OS-3C1S	3 x 1.0	19/0.25	0.3	6.0	76
FRA-TW-1M-OS-4C1S	4 x 1.0	19/0.25	0.3	6.5	88
FRA-TW-1M-OS-6C1S	6 x 1.0	19/0.25	0.3	7.8	114
FRA-TW-1M-OS-8C1S	8 x 1.0	19/0.25	0.3	8.9	171
FRA-TW-1M-OS-25C1S	25 x 1.0	19/0.25	0.3	13.8	392
FRA-TW-1M-OS-2P1S	2 x 2 x 1.0	19/0.25	0.3	8.3	117
FRA-TW-1M-OS-2C1.5S	2 x 1.5	19/0.3	0.3	6.5	86
FRA-TW-1M-OS-3C1.5S	3 x 1.5	19/0.3	0.3	6.8	95
FRA-TW-1M-OS-4C1.5S	4 x 1.5	19/0.3	0.3	7.4	118
FRA-TW-1M-OS-6C1.5S	6 x 1.5	19/0.3	0.3	9.0	168
FRA-TW-1M-OS-18C1.5S	18 x 1.5	19/0.3	0.3	14.4	452
FRA-TW-1M-OS-2C2.5S	2 x 2.5	19/0.4	0.4	7.8	122
FRA-TW-1M-OS-4C2.5S	4 x 2.5	19/0.4	0.4	8.4	152
FRA-TW-1M-OS-6C2.5S	6 x 2.5	19/0.4	0.4	11.4	268


Impact Resistant


Highly Flexible

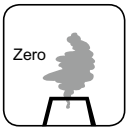

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
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Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

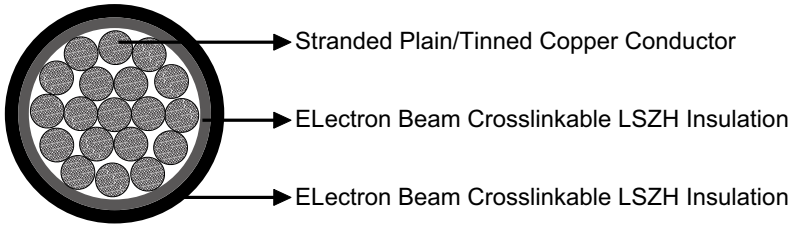
0.6/1KV Single Core Dual Wall Traction Cables

Applications

Single Core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts

Standards

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0



Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation 1: Electron beam crosslinkable thin wall LSZH compound
- Insulation 2: Electron beam crosslinkable thin wall LSZH compound

Options

FRA-DW-1S (Sheathed); FRA-DW-1S-OS (Screened & sheathed);
FRA-DW-1SU-FR (Fire resistant & Unsheathed)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	0.5	0.6	0.75	1.0	1.2	1.5	2.5	3	4
Maximum Conductor Resistance	Ω/km	40.1	31.1	26.7	20	15.5	13.7	8.21	6.56	5.09
Voltage Rating	KV	0.6/1.0								

Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

Dimensions and Weight

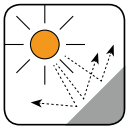
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-DW-1SU-1C0.5S	1 x 0.5	19/0.18	0.2	1.3	5.5

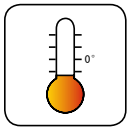
FIRERAIL TRACTION CABLES FOR RAILWAY APPLICATIONS

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-DW-1SU-1C0.6S	1 x 0.6	19/0.20	0.2	1.39	6.5
FRA-DW-1SU-1C0.75S	1 x 0.75	19/0.22	0.2	1.52	8
FRA-DW-1SU-1C1S	1 x 1.0	19/0.26	0.2	1.67	10
FRA-DW-1SU-1C1.2S	1 x 1.2	19/0.28	0.2	1.83	12
FRA-DW-1SU-1C1.5S	1 x 1.5	19/0.30	0.3	2.04	15
FRA-DW-1SU-1C2S	1 x 2.0	37/0.25	0.3	2.29	19
FRA-DW-1SU-1C2.5S	1 x 2.5	19/0.40	0.3	2.54	24
FRA-DW-1SU-1C3S	1 x 3.0	37/0.32	0.3	2.78	29
FRA-DW-1SU-1C4S	1 x 4.0	56/0.30	0.4	3.21	39


Impact Resistant


Highly Flexible

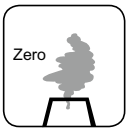

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

0.6/1KV Multicore Dual Wall Traction Cables

Applications

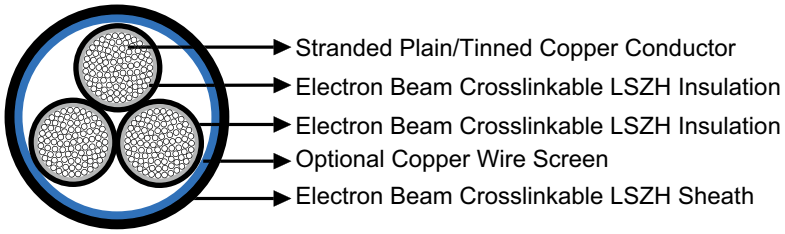
Multicore unscreened and screened power and control cable designed for protected, fixed installation for connecting fixed parts inside equipment.

Standards

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0

Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation 1: Electron beam crosslinkable thin wall LSZH compound
- Insulation 2: Electron beam crosslinkable thin wall LSZH compound
- Screen (optional) : Copper Wire Screen (screened cables)
- Outer sheath: Electron beam crosslinkable LSZH compound



Options

FRA-TW-1M-FR (Fire resistant)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	0.25	0.5	0.75	1.0	1.5	2.5
Maximum Conductor Resistance	Ω/km	88.5	40.1	26.7	20	13.7	8.21
Voltage Rating	KV	0.6/1.0					

Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

Dimensions and Weight

FRA-DW-1M (Multicore unscreened)

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-DW-1M-2C0.5S	2 x 0.5	19/0.18	0.2	4.0	24

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-DW-1M-3C0.5S	3 x 0.5	19/0.18	0.2	4.6	36
FRA-DW-1M-5C0.5S	5 x 0.5	19/0.18	0.2	5.0	43
FRA-DW-1M-9C0.5S	9 x 0.5	19/0.18	0.2	6.7	66
FRA-DW-1M-12C0.5S	12 x 0.5	19/0.18	0.2	6.9	89
FRA-DW-1M-16C0.5S	16 x 0.5	19/0.18	0.2	7.8	115
FRA-DW-1M-25C0.5S	25 x 0.5	19/0.18	0.2	9.5	170
FRA-DW-1M-30C0.5S	30 x 0.5	19/0.18	0.2	10.1	205
FRA-DW-1M-2P0.5S	2 x 2 x 0.5	19/0.18	0.2	5.8	50
FRA-DW-1M-2C0.75S	2 x 0.75	19/0.22	0.2	4.4	32
FRA-DW-1M-4C0.75S	4 x 0.75	19/0.22	0.2	5.0	49
FRA-DW-1M-9C0.75S	9 x 0.75	19/0.22	0.2	7.7	106
FRA-DW-1M-14C0.75S	14 x 0.75	19/0.22	0.2	8.4	140
FRA-DW-1M-27C0.75S	27 x 0.75	19/0.22	0.2	11.3	270
FRA-DW-1M-36C0.75S	36 x 0.75	19/0.22	0.2	12.8	360
FRA-DW-1M-3C1S	3 x 1.0	19/0.25	0.2	5.0	47
FRA-DW-1M-6C1S	6 x 1.0	19/0.25	0.2	6.6	88
FRA-DW-1M-14C1S	14 x 1.0	19/0.25	0.2	9.1	174
FRA-DW-1M-20C1S	20 x 1.0	19/0.25	0.2	11.2	256
FRA-DW-1M-50C1S	50 x 1.0	19/0.25	0.2	16.8	620
FRA-DW-1M-2C1.5S	2 x 1.5	37/0.22	0.3	5.4	55
FRA-DW-1M-5C1.5S	5 x 1.5	37/0.22	0.3	7.1	110
FRA-DW-1M-7C1.5S	7 x 1.5	37/0.22	0.3	8.4	150
FRA-DW-1M-10C1.5S	10 x 1.5	37/0.22	0.3	9.9	170
FRA-DW-1M-18C1.5S	18 x 1.5	37/0.22	0.3	12.4	350
FRA-DW-1M-30C1.5S	30 x 1.5	37/0.22	0.3	15.6	560
FRA-DW-1M-50C1.5S	50 x 1.5	37/0.22	0.3	20.1	870
FRA-DW-1M-3C2.5S	3 x 2.5	37/0.29	0.3	7.0	105
FRA-DW-1M-6C2.5S	6 x 2.5	37/0.29	0.3	9.6	200
FRA-DW-1M-12C2.5S	12 x 2.5	37/0.29	0.3	12.6	360
FRA-DW-1M-18C2.5S	18 x 2.5	37/0.29	0.3	15.3	545
FRA-DW-1M-24C2.5S	24 x 2.5	37/0.29	0.3	17.8	695
FRA-DW-1M-30C2.5S	30 x 2.5	37/0.29	0.3	19.3	870
FRA-DW-1M-36C2.5S	36 x 2.5	37/0.29	0.3	21.0	1050

FRA-DW-1M-OS (Multicore screened)

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-DW-1M-OS-2P0.25S	2 x 2 x 0.25	19/0.13	0.2	5.7	48.9
FRA-DW-1M-OS-3P0.25S	3 x 2 x 0.25	19/0.13	0.2	6.1	57.2
FRA-DW-1M-OS-4P0.25S	4 x 2 x 0.25	19/0.13	0.2	7.0	72
FRA-DW-1M-OS-7P0.25S	7 x 2 x 0.25	19/0.13	0.2	7.8	92
FRA-DW-1M-OS-25C0.25S	25 x 0.25	19/0.13	0.2	8.9	139
FRA-DW-1M-OS-2C0.5S	2 x 0.5	19/0.18	0.2	4.3	34
FRA-DW-1M-OS-3C0.5S	3 x 0.5	19/0.18	0.2	4.5	40
FRA-DW-1M-OS-4C0.5S	4 x 0.5	19/0.18	0.2	4.8	47
FRA-DW-1M-OS-5C0.5S	5 x 0.5	19/0.18	0.2	5.4	58
FRA-DW-1M-OS-6C0.5S	6 x 0.5	19/0.18	0.2	5.9	70
FRA-DW-1M-OS-7C0.5S	7 x 0.5	19/0.18	0.2	6.3	80
FRA-DW-1M-OS-8C0.5S	8 x 0.5	19/0.18	0.2	6.8	86
FRA-DW-1M-OS-9C0.5S	9 x 0.5	19/0.18	0.2	7.2	95
FRA-DW-1M-OS-10C0.5S	10 x 0.5	19/0.18	0.2	7.2	101
FRA-DW-1M-OS-12C0.5S	12 x 0.5	19/0.18	0.2	7.4	112
FRA-DW-1M-OS-15C0.5S	15 x 0.5	19/0.18	0.2	8.5	135
FRA-DW-1M-OS-16C0.5S	16 x 0.5	19/0.18	0.2	8.5	142
FRA-DW-1M-OS-18C0.5S	18 x 0.5	19/0.18	0.2	8.9	162
FRA-DW-1M-OS-20C0.5S	20 x 0.5	19/0.18	0.2	9.3	185
FRA-DW-1M-OS-22C0.5S	22 x 0.5	19/0.18	0.2	9.9	195
FRA-DW-1M-OS-25C0.5S	25 x 0.5	19/0.18	0.2	10.3	213
FRA-DW-1M-OS-27C0.5S	27 x 0.5	19/0.18	0.2	10.5	231

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-DW-1M-OS-30C0.5S	30 x 0.5	19/0.18	0.2	11.3	265
FRA-DW-1M-OS-36C0.5S	36 x 0.5	19/0.18	0.2	12.1	301
FRA-DW-1M-OS-42C0.5S	42 x 0.5	19/0.18	0.2	12.9	360
FRA-DW-1M-OS-48C0.5S	48 x 0.5	19/0.18	0.2	13.6	410
FRA-DW-1M-OS-50C0.5S	50 x 0.5	19/0.18	0.2	14.2	430
FRA-DW-1M-OS-2P0.5S	2 x 2 x 0.5	19/0.18	0.2	6.4	69
FRA-DW-1M-OS-3P0.5S	3 x 2 x 0.5	19/0.18	0.2	6.7	80
FRA-DW-1M-OS-4P0.5S	4 x 2 x 0.5	19/0.18	0.2	7.4	95
FRA-DW-1M-OS-5P0.5S	5 x 2 x 0.5	19/0.18	0.2	9.2	136
FRA-DW-1M-OS-6P0.5S	6 x 2 x 0.5	19/0.18	0.2	9.2	148
FRA-DW-1M-OS-8P0.5S	8 x 2 x 0.5	19/0.18	0.2	9.7	155
FRA-DW-1M-OS-10P0.5S	10 x 2 x 0.5	19/0.18	0.2	10.9	200
FRA-DW-1M-OS-12P0.5S	12 x 2 x 0.5	19/0.18	0.2	12.1	240
FRA-DW-1M-OS-15P0.5S	15 x 2 x 0.5	19/0.18	0.2	13.0	300
FRA-DW-1M-OS-16P0.5S	16 x 2 x 0.5	19/0.18	0.2	13.0	320
FRA-DW-1M-OS-20P0.5S	20 x 2 x 0.5	19/0.18	0.2	14.4	360
FRA-DW-1M-OS-2T0.5S	2 x 3 x 0.5	19/0.18	0.2	7.3	90
FRA-DW-1M-OS-2C0.75S	2 x 0.75	19/0.22	0.2	4.8	40
FRA-DW-1M-OS-3C0.75S	3 x 0.75	19/0.22	0.2	5.0	50
FRA-DW-1M-OS-4C0.75S	4 x 0.75	19/0.22	0.2	5.5	62
FRA-DW-1M-OS-5C0.75S	5 x 0.75	19/0.22	0.2	6.1	75
FRA-DW-1M-OS-6C0.75S	6 x 0.75	19/0.22	0.2	6.6	85
FRA-DW-1M-OS-7C0.75S	7 x 0.75	19/0.22	0.2	7.2	100
FRA-DW-1M-OS-8C0.75S	8 x 0.75	19/0.22	0.2	7.8	113
FRA-DW-1M-OS-10C0.75S	10 x 0.75	19/0.22	0.2	8.1	130
FRA-DW-1M-OS-12C0.75S	12 x 0.75	19/0.22	0.2	8.4	150
FRA-DW-1M-OS-14C0.75S	14 x 0.75	19/0.22	0.2	9.1	170
FRA-DW-1M-OS-16C0.75S	16 x 0.75	19/0.22	0.2	9.7	206
FRA-DW-1M-OS-18C0.75S	18 x 0.75	19/0.22	0.2	10.2	230
FRA-DW-1M-OS-20C0.75S	20 x 0.75	19/0.22	0.2	11.1	258
FRA-DW-1M-OS-24C0.75S	24 x 0.75	19/0.22	0.2	12.0	294
FRA-DW-1M-OS-25C0.75S	25 x 0.75	19/0.22	0.2	12.3	300
FRA-DW-1M-OS-2P0.75S	2 x 2 x 0.75	19/0.22	0.2	7.1	86
FRA-DW-1M-OS-3P0.75S	3 x 2 x 0.75	19/0.22	0.2	7.6	109
FRA-DW-1M-OS-4P0.75S	4 x 2 x 0.75	19/0.22	0.2	9.9	143
FRA-DW-1M-OS-5P0.75S	5 x 2 x 0.75	19/0.22	0.2	10.7	182
FRA-DW-1M-OS-6P0.75S	6 x 2 x 0.75	19/0.22	0.2	11.9	227
FRA-DW-1M-OS-7P0.75S	7 x 2 x 0.75	19/0.22	0.2	13.4	279
FRA-DW-1M-OS-8P0.75S	8 x 2 x 0.75	19/0.22	0.2	13.2	291
FRA-DW-1M-OS-10P0.75S	10 x 2 x 0.75	19/0.22	0.2	14.8	333
FRA-DW-1M-OS-3T0.75S	3 x 3 x 0.75	19/0.22	0.2	8.9	151
FRA-DW-1M-OS-5Q0.75S	5 x 4 x 0.75	19/0.22	0.2	12.8	290
FRA-DW-1M-OS-2C1S	2 x 1.0	19/0.25	0.2	5.0	50
FRA-DW-1M-OS-3C1S	3 x 1.0	19/0.25	0.2	5.5	60
FRA-DW-1M-OS-4C1S	4 x 1.0	19/0.25	0.2	5.8	72
FRA-DW-1M-OS-5C1S	5 x 1.0	19/0.25	0.2	6.6	88
FRA-DW-1M-OS-6C1S	6 x 1.0	19/0.25	0.2	7.3	114
FRA-DW-1M-OS-7C1S	7 x 1.0	19/0.25	0.2	7.9	134
FRA-DW-1M-OS-8C1S	8 x 1.0	19/0.25	0.2	8.5	150
FRA-DW-1M-OS-9C1S	9 x 1.0	19/0.25	0.2	8.9	160
FRA-DW-1M-OS-10C1S	10 x 1.0	19/0.25	0.2	8.9	168
FRA-DW-1M-OS-12C1S	12 x 1.0	19/0.25	0.2	9.2	188
FRA-DW-1M-OS-16C1S	16 x 1.0	19/0.25	0.2	10.5	250
FRA-DW-1M-OS-18C1S	18 x 1.0	19/0.25	0.2	11.2	275
FRA-DW-1M-OS-25C1S	25 x 1.0	19/0.25	0.2	12.7	357
FRA-DW-1M-OS-27C1S	27 x 1.0	19/0.25	0.2	13.3	395
FRA-DW-1M-OS-30C1S	30 x 1.0	19/0.25	0.2	13.8	450
FRA-DW-1M-OS-36C1S	36 x 1.0	19/0.25	0.2	15.2	530
FRA-DW-1M-OS-42C1S	42 x 1.0	19/0.25	0.2	16.3	605
FRA-DW-1M-OS-50C1S	50 x 1.0	19/0.25	0.2	17.8	690
FRA-DW-1M-OS-2P1S	2 x 2 x 1.0	19/0.25	0.2	7.9	107
FRA-DW-1M-OS-4P1S	4 x 2 x 1.0	19/0.25	0.2	9.4	128
FRA-DW-1M-OS-6P1S	6 x 2 x 1.0	19/0.25	0.2	11.6	240

FIRERAIL TRACTION CABLES FOR RAILWAY APPLICATIONS

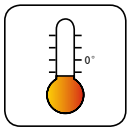
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-DW-1M-OS-12P1S	12 x 2 x 1.0	19/0.25	0.2	14.3	400
FRA-DW-1M-OS-4T1S	4 x 3 x 1.0	19/0.25	0.2	11.5	230
FRA-DW-1M-OS-3Q1S	3 x 4 x 1.0	19/0.25	0.2	11.3	245
FRA-DW-1M-OS-4Q1S	4 x 4 x 1.0	19/0.25	0.2	12.5	267
FRA-DW-1M-OS-2C1.5S	2 x 1.5	37/0.22	0.3	5.8	70
FRA-DW-1M-OS-3C1.5S	3 x 1.5	37/0.22	0.3	6.1	81
FRA-DW-1M-OS-4C1.5S	4 x 1.5	37/0.22	0.3	6.7	100
FRA-DW-1M-OS-5C1.5S	5 x 1.5	37/0.22	0.3	7.7	135
FRA-DW-1M-OS-6C1.5S	6 x 1.5	37/0.22	0.3	8.3	155
FRA-DW-1M-OS-7C1.5S	7 x 1.5	37/0.22	0.3	9.1	184
FRA-DW-1M-OS-8C1.5S	8 x 1.5	37/0.22	0.3	10.3	222
FRA-DW-1M-OS-9C1.5S	9 x 1.5	37/0.22	0.3	10.5	234
FRA-DW-1M-OS-10C1.5S	10 x 1.5	37/0.22	0.3	10.5	240
FRA-DW-1M-OS-12C1.5S	12 x 1.5	37/0.22	0.3	10.9	268
FRA-DW-1M-OS-14C1.5S	14G 1.5	37/0.22	0.3	12.2	333
FRA-DW-1M-OS-16C1.5S	16 x 1.5	37/0.22	0.3	12.5	364
FRA-DW-1M-OS-18C1.5S	18 x 1.5	37/0.22	0.3	13.2	405
FRA-DW-1M-OS-25C1.5S	25 x 1.5*	37/0.22	0.3	15.8	562
FRA-DW-1M-OS-48C1.5S	48 x 1.5	37/0.22	0.3	20.7	989
FRA-DW-1M-OS-2P1.5S	2 x 2 x 1.5	37/0.22	0.3	9.2	153
FRA-DW-1M-OS-3P1.5S	3 x 2 x 1.5	37/0.22	0.3	9.8	205
FRA-DW-1M-OS-7P1.5S	7 x 2 x 1.5	37/0.22	0.3	12.6	330
FRA-DW-1M-OS-2C2.5S	2 x 2.5	37/0.29	0.3	7.0	105
FRA-DW-1M-OS-3C2.5S	3 x 2.5	37/0.29	0.3	7.6	130
FRA-DW-1M-OS-4C2.5S	4 x 2.5	37/0.29	0.3	8.4	170
FRA-DW-1M-OS-5C2.5S	5 x 2.5	37/0.29	0.3	9.4	190
FRA-DW-1M-OS-6C2.5S	6 x 2.5	37/0.29	0.3	10.4	225
FRA-DW-1M-OS-7C2.5S	7 x 2.5	37/0.29	0.3	11.4	270
FRA-DW-1M-OS-8C2.5S	8 x 2.5	37/0.29	0.3	12.6	343
FRA-DW-1M-OS-10C2.5S	10 x 2.5	37/0.29	0.3	13.2	370
FRA-DW-1M-OS-12C2.5S	12 x 2.5	37/0.29	0.3	13.6	420
FRA-DW-1M-OS-16C2.5S	16 x 2.5	37/0.29	0.3	15.7	560
FRA-DW-1M-OS-18C2.5S	18 x 2.5	37/0.29	0.3	16.6	620
FRA-DW-1M-OS-25C2.5S	25 x 2.5	37/0.29	0.3	19.3	835
FRA-DW-1M-OS-27C2.5S	27 x 2.5	37/0.29	0.3	20.5	870
FRA-DW-1M-OS-48C2.5S	48 x 2.5	37/0.29	0.3	25.7	1560

* earth cable (yellow/green) can be offered


Impact Resistant


Highly Flexible

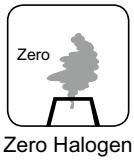

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

1.8/3KV Single Core Standard Wall Traction Cables

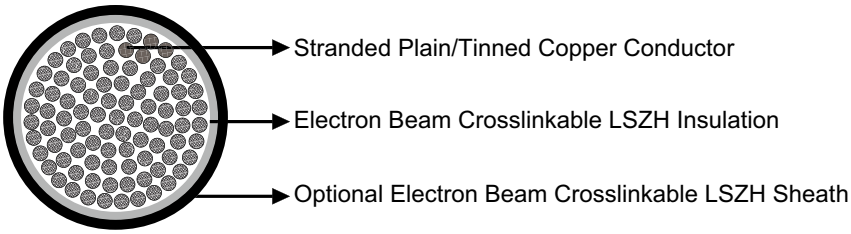
Applications

Single Core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts in direct current and alternating voltage technology, especially converter technology

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0

Construction



- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation: Electron beam crosslinkable standard wall LSZH compound
- Outer sheath (optional): Electron beam crosslinkable LSZH compound (for sheathed cables).

Optional

FRA-SW-3S-OS (Screened & sheathed);
FRA-SW-3SU-FR(Fire resistant & unsheathed)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5	2.5	4.0	6.0	10	16	25	35	50
Maximum Conductor Resistance	Ω/km	13.7	8.21	5.09	3.39	1.95	1.24	0.795	0.565	0.393
Voltage Rating	KV	1.8/3								

Nominal Conductor Cross Section	mm^2	70	95	120	150	185	240	300	400
Maximum Conductor Resistance	Ω/km	0.277	0.21	0.164	0.132	0.108	0.0817	0.0654	0.0495
Voltage Rating	KV	1.8/3							

Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

↘ Dimensions and Weight

FRA-SW-3SU (Unsheathed)

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-SW-3SU-1C1.5S	1 x 1.5	30/0.25	2.5	6.8	70
FRA-SW-3SU-1C2.5S	1 x 2.5	50/0.25	2.5	7.2	90
FRA-SW-3SU-1C4S	1 x 4.0	56/0.30	2.5	7.8	110
FRA-SW-3SU-1C6S	1 x 6.0	84/0.30	2.5	8.3	130
FRA-SW-3SU-1C10S	1 x 10.0	80/0.40	2.5	9.2	190
FRA-SW-3SU-1C16S	1 x 16.0	126/0.40	2.5	10.3	250
FRA-SW-3SU-1C25S	1 x 25.0	196/0.40	2.5	11.8	330
FRA-SW-3SU-1C35S	1 x 35.0	276/0.40	2.5	13.1	430
FRA-SW-3SU-1C50S	1 x 50.0	396/0.40	2.5	14.6	570
FRA-SW-3SU-1C70S	1 x 70.0	360/0.50	2.7	16.4	760
FRA-SW-3SU-1C95S	1 x 95.0	475/0.50	2.7	18.4	980
FRA-SW-3SU-1C120S	1 x 120.0	608/0.50	2.7	20.1	1210
FRA-SW-3SU-1C150S	1 x 150.0	756/0.50	2.7	21.7	1500
FRA-SW-3SU-1C185S	1 x 185.0	925/0.50	2.7	23.5	1800
FRA-SW-3SU-1C240S	1 x 240.0	1221/0.50	2.7	26.2	2360
FRA-SW-3SU-1C300S	1 x 300.0	1525/0.50	2.7	28.6	2840
FRA-SW-3SU-1C400S	1 x 400.0	2013/0.50	2.9	32.4	3800

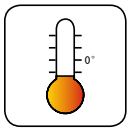
FRA-SW-3S (Sheathed)

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-SW-3S-1C1.5S	1 x 1.5	30/0.25	1.3	7.3	80
FRA-SW-3S-1C2.5S	1 x 2.5	50/0.25	1.3	7.7	100
FRA-SW-3S-1C4S	1 x 4.0	56/0.30	1.3	8.3	120
FRA-SW-3S-1C6S	1 x 6.0	84/0.30	1.3	8.8	140
FRA-SW-3S-1C10S	1 x 10.0	80/0.40	2.2	11.5	250
FRA-SW-3S-1C16S	1 x 16.0	126/0.40	2.2	12.7	310
FRA-SW-3S-1C25S	1 x 25.0	196/0.40	2.2	14.1	410
FRA-SW-3S-1C35S	1 x 35.0	276/0.40	2.2	15.4	520
FRA-SW-3S-1C50S	1 x 50.0	396/0.40	2.2	17.0	660
FRA-SW-3S-1C70S	1 x 70.0	360/0.50	2.2	19.0	880
FRA-SW-3S-1C95S	1 x 95.0	475/0.50	2.4	21.0	1130
FRA-SW-3S-1C120S	1 x 120.0	608/0.50	2.4	22.9	1370
FRA-SW-3S-1C150S	1 x 150.0	756/0.50	2.4	24.7	1690
FRA-SW-3S-1C185S	1 x 185.0	925/0.50	2.4	26.1	2000
FRA-SW-3S-1C240S	1 x 240.0	1221/0.50	2.4	29.3	2620
FRA-SW-3S-1C300S	1 x 300.0	1525/0.50	2.4	31.9	3140
FRA-SW-3S-1C400S	1 x 400.0	2013/0.50	2.6	35.5	4140


Impact Resistant


Highly Flexible

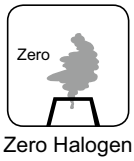

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

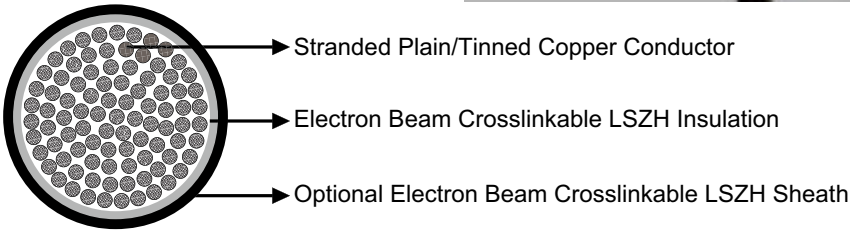
1.8/3KV Single Core Medium Wall Traction Cables

Applications

Single core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts in direct current and alternating voltage technology, especially converter technology

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0



Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation: Electron beam crosslinkable medium wall LSZH compound
- Outer sheath: Electron beam crosslinkable LSZH compound (for sheathed cables).

Optional

FRA-MW-3S-OS (Screened & sheathed);

FRA-MW-3SU-FR(Fire resistant & unsheathed)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5	2.5	4.0	6.0	10	16	25	35	50
Maximum Conductor Resistance	Ω/km	13.7	8.21	5.09	3.39	1.95	1.24	0.795	0.565	0.393
Voltage Rating	KV	1.8/3								

Nominal Conductor Cross Section	mm^2	70	95	120	150	185	240	300	400
Maximum Conductor Resistance	Ω/km	0.277	0.21	0.164	0.132	0.108	0.0817	0.0654	0.0495
Voltage Rating	KV	1.8/3							

Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

Dimensions and Weight

FRA-MW-3SU (Unsheathed)

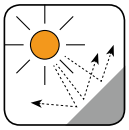
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-MW-3SU-1C1.5S	1 x 1.5	30/0.25	2.0	5.8	50
FRA-MW-3SU-1C2.5S	1 x 2.5	50/0.25	2.0	6.2	60
FRA-MW-3SU-1C4S	1 x 4.0	56/0.30	2.0	6.8	80
FRA-MW-3SU-1C6S	1 x 6.0	84/0.30	2.0	7.3	100
FRA-MW-3SU-1C10S	1 x 10.0	80/0.40	2.0	8.2	150
FRA-MW-3SU-1C16S	1 x 16.0	126/0.40	2.0	9.3	220
FRA-MW-3SU-1C25S	1 x 25.0	196/0.40	2.0	10.8	290
FRA-MW-3SU-1C35S	1 x 35.0	276/0.40	2.0	12.1	390
FRA-MW-3SU-1C50S	1 x 50.0	396/0.40	2.0	13.6	530
FRA-MW-3SU-1C70S	1 x 70.0	360/0.50	2.0	15.4	720
FRA-MW-3SU-1C95S	1 x 95.0	475/0.50	2.2	17.4	940
FRA-MW-3SU-1C120S	1 x 120.0	608/0.50	2.2	19.1	1160
FRA-MW-3SU-1C150S	1 x 150.0	756/0.50	2.2	20.7	1440
FRA-MW-3SU-1C185S	1 x 185.0	925/0.50	2.4	22.7	1760
FRA-MW-3SU-1C240S	1 x 240.0	1221/0.50	2.4	25.6	2350
FRA-MW-3SU-1C300S	1 x 300.0	1525/0.50	2.4	27.9	2820
FRA-MW-3SU-1C400S	1 x 400.0	2013/0.50	2.6	31.7	3730

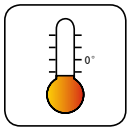
FRA-MW-3S (Sheathed)

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-MW-3S-1C1.5S	1 x 1.5	30/0.25	1.3	6.2	60
FRA-MW-3S-1C2.5S	1 x 2.5	50/0.25	1.3	6.5	70
FRA-MW-3S-1C4S	1 x 4.0	56/0.30	1.3	7.1	90
FRA-MW-3S-1C6S	1 x 6.0	84/0.30	1.3	7.6	110
FRA-MW-3S-1C10S	1 x 10.0	80/0.40	1.5	8.9	170
FRA-MW-3S-1C16S	1 x 16.0	126/0.40	1.5	10	240
FRA-MW-3S-1C25S	1 x 25.0	196/0.40	1.8	12.5	350
FRA-MW-3S-1C35S	1 x 35.0	276/0.40	1.8	13.8	450
FRA-MW-3S-1C50S	1 x 50.0	396/0.40	1.8	15.3	590
FRA-MW-3S-1C70S	1 x 70.0	360/0.50	1.8	17.2	790
FRA-MW-3S-1C95S	1 x 95.0	475/0.50	2.2	19.5	1050
FRA-MW-3S-1C120S	1 x 120.0	608/0.50	2.2	21.3	1270
FRA-MW-3S-1C150S	1 x 150.0	756/0.50	2.2	23.3	1590
FRA-MW-3S-1C185S	1 x 185.0	925/0.50	2.4	25.4	1900
FRA-MW-3S-1C240S	1 x 240.0	1221/0.50	2.4	28.1	2490
FRA-MW-3S-1C300S	1 x 300.0	1525/0.50	2.4	30.5	3010
FRA-MW-3S-1C400S	1 x 400.0	2013/0.50	2.6	34.7	3980


Impact Resistant


Highly Flexible


UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

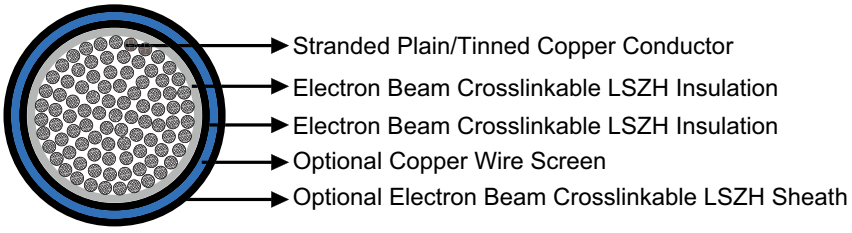
1.8/3KV Single Core Dual Wall Traction Cables

Applications

Single core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts in direct current and alternating voltage technology, especially converter technology

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0



Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation1: Electron beam crosslinkable thin wall LSZH compound
- Insulation2: Electron beam crosslinkable thin wall LSZH compound
- Screen(optional): Copper Wire Screen (for screened and sheathed cables)
- Outer sheath(optional): Electron beam crosslinkable LSZH compound (for screened and sheathed cables).

Optional

FRA-TW-3SU-FR(Fire resistant & unsheathed)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5	2.5	4.0	6.0	10	16	25	35	50
Maximum Conductor Resistance	Ω/km	13.7	8.21	5.09	3.39	1.95	1.24	0.795	0.565	0.393
Voltage Rating	KV	1.8/3								

Nominal Conductor Cross Section	mm^2	70	95	120	150	185	240	300	400
Maximum Conductor Resistance	Ω/km	0.277	0.21	0.164	0.132	0.108	0.0817	0.0654	0.0495
Voltage Rating	KV	1.8/3							

Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

Dimensions and Weight

FRA-DW-3SU (Unsheathed)

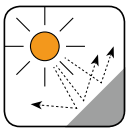
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-DW-3SU-1C1.5S	1 x 1.5	30/0.25	0.8	3.2	22
FRA-DW-3SU-1C2S	1 x 2.0	37/0.25	0.9	3.55	28
FRA-DW-3SU-1C2.5S	1 x 2.5	50/0.25	0.9	3.75	34
FRA-DW-3SU-1C4S	1 x 4.0	56/0.30	1.0	4.50	52
FRA-DW-3SU-1C6S	1 x 6.0	84/0.30	1.1	5.10	74
FRA-DW-3SU-1C10S	1 x 10.0	80/0.40	1.2	6.35	120
FRA-DW-3SU-1C16S	1 x 16.0	126/0.40	1.5	8.30	180
FRA-DW-3SU-1C25S	1 x 25.0	196/0.40	1.8	10.20	280
FRA-DW-3SU-1C35S	1 x 35.0	276/0.40	2.0	11.70	390
FRA-DW-3SU-1C50S	1 x 50.0	396/0.40	2.2	13.60	550
FRA-DW-3SU-1C70S	1 x 70.0	360/0.50	2.1	15.60	730
FRA-DW-3SU-1C95S	1 x 95.0	475/0.50	2.3	17.30	940
FRA-DW-3SU-1C120S	1 x 120.0	608/0.50	2.4	19.60	1180
FRA-DW-3SU-1C150S	1 x 150.0	756/0.50	2.6	21.90	1510
FRA-DW-3SU-1C185S	1 x 185.0	925/0.50	2.8	23.80	1800
FRA-DW-3SU-1C240S	1 x 240.0	1221/0.50	2.9	26.90	2290
FRA-DW-3SU-1C300S	1 x 300.0	1525/0.50	3.0	29.70	2910
FRA-DW-3SU-1C400S	1 x 400.0	2013/0.50	3.4	35.80	4040

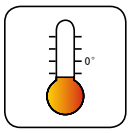
FRA-DW-3S-OS (Screened & Sheathed)

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-DW-3S-OS-1C1.5S	1 x 1.5	30/0.25	0.8	5.2	48
FRA-DW-3S-OS-1C2.5S	1 x 2.5	50/0.25	0.9	5.8	63
FRA-DW-3S-OS-1C4S	1 x 4.0	56/0.30	1.0	6.7	89
FRA-DW-3S-OS-1C6S	1 x 6.0	84/0.30	1.1	7.4	120
FRA-DW-3S-OS-1C10S	1 x 10.0	80/0.40	1.2	9.0	180
FRA-DW-3S-OS-1C16S	1 x 16.0	126/0.40	1.5	11.2	280
FRA-DW-3S-OS-1C25S	1 x 25.0	196/0.40	1.8	13.4	400
FRA-DW-3S-OS-1C35S	1 x 35.0	276/0.40	2.0	14.8	510
FRA-DW-3S-OS-1C50S	1 x 50.0	396/0.40	2.2	16.8	700
FRA-DW-3S-OS-1C70S	1 x 70.0	360/0.50	2.1	19.0	920
FRA-DW-3S-OS-1C95S	1 x 95.0	475/0.50	2.3	20.7	1160
FRA-DW-3S-OS-1C120S	1 x 120.0	608/0.50	2.4	23.4	1450
FRA-DW-3S-OS-1C150S	1 x 150.0	756/0.50	2.6	25.9	1830
FRA-DW-3S-OS-1C185S	1 x 185.0	925/0.50	2.8	27.8	2130
FRA-DW-3S-OS-1C240S	1 x 240.0	1221/0.50	2.9	31.2	2910
FRA-DW-3S-OS-1C300S	1 x 300.0	1525/0.50	3.0	34.2	3370


Impact Resistant


Highly Flexible


UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

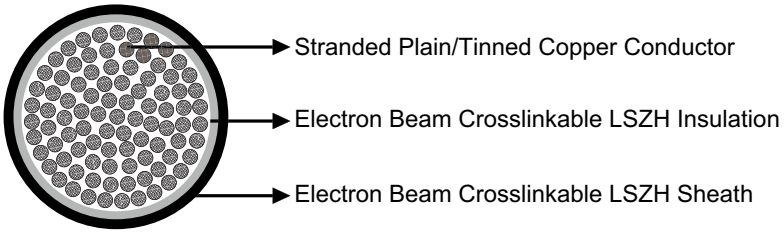
3.6/6KV Single Core Standard Wall Traction Cables

Applications

Single core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts in direct current and alternating voltage technology, especially converter technology

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0



Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation: Electron beam crosslinkable standard wall LSZH compound.
- Outer sheath: Electron beam crosslinkable LSZH compound.

Optional

FRA-SW-6S-OS (Screened);
FRA-SW-6S-FR(Fire resistant)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5	2.5	4.0	6.0	10	16	25	35	50
Maximum Conductor Resistance	Ω/km	13.7	8.21	5.09	3.39	1.95	1.24	0.795	0.565	0.393
Voltage Rating	KV	3.6/6								

Nominal Conductor Cross Section	mm^2	70	95	120	150	185	240	300	400
Maximum Conductor Resistance	Ω/km	0.277	0.21	0.164	0.132	0.108	0.0817	0.0654	0.0495
Voltage Rating	KV	3.6/6							

Mechanical and Thermal Properties

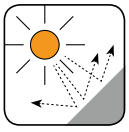
- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

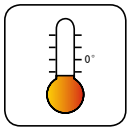
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-SW-6S-1C2.5S	1 x 2.5	50/0.25	3.0	11.4	170
FRA-SW-6S-1C4S	1 x 4.0	56/0.30	3.0	12.0	190
FRA-SW-6S-1C6S	1 x 6.0	84/0.30	3.0	12.5	230
FRA-SW-6S-1C10S	1 x 10.0	80/0.40	3.0	13.4	300
FRA-SW-6S-1C16S	1 x 16.0	126/0.40	3.0	14.5	360
FRA-SW-6S-1C25S	1 x 25.0	196/0.40	3.0	16.0	450
FRA-SW-6S-1C35S	1 x 35.0	276/0.40	3.0	17.3	560
FRA-SW-6S-1C50S	1 x 50.0	396/0.40	3.0	19.0	720
FRA-SW-6S-1C70S	1 x 70.0	360/0.50	3.0	20.8	930
FRA-SW-6S-1C95S	1 x 95.0	475/0.50	3.0	22.6	1160
FRA-SW-6S-1C120S	1 x 120.0	608/0.50	3.1	24.7	1430
FRA-SW-6S-1C150S	1 x 150.0	756/0.50	3.1	26.3	1740
FRA-SW-6S-1C185S	1 x 185.0	925/0.50	3.2	28.5	2080
FRA-SW-6S-1C240S	1 x 240.0	1221/0.50	3.4	31.7	2730
FRA-SW-6S-1C300S	1 x 300.0	1525/0.50	3.4	34.2	3230
FRA-SW-6S-1C400S	1 x 400.0	2013/0.50	3.4	37.8	4210


Impact Resistant


Highly Flexible

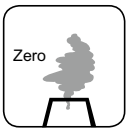

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

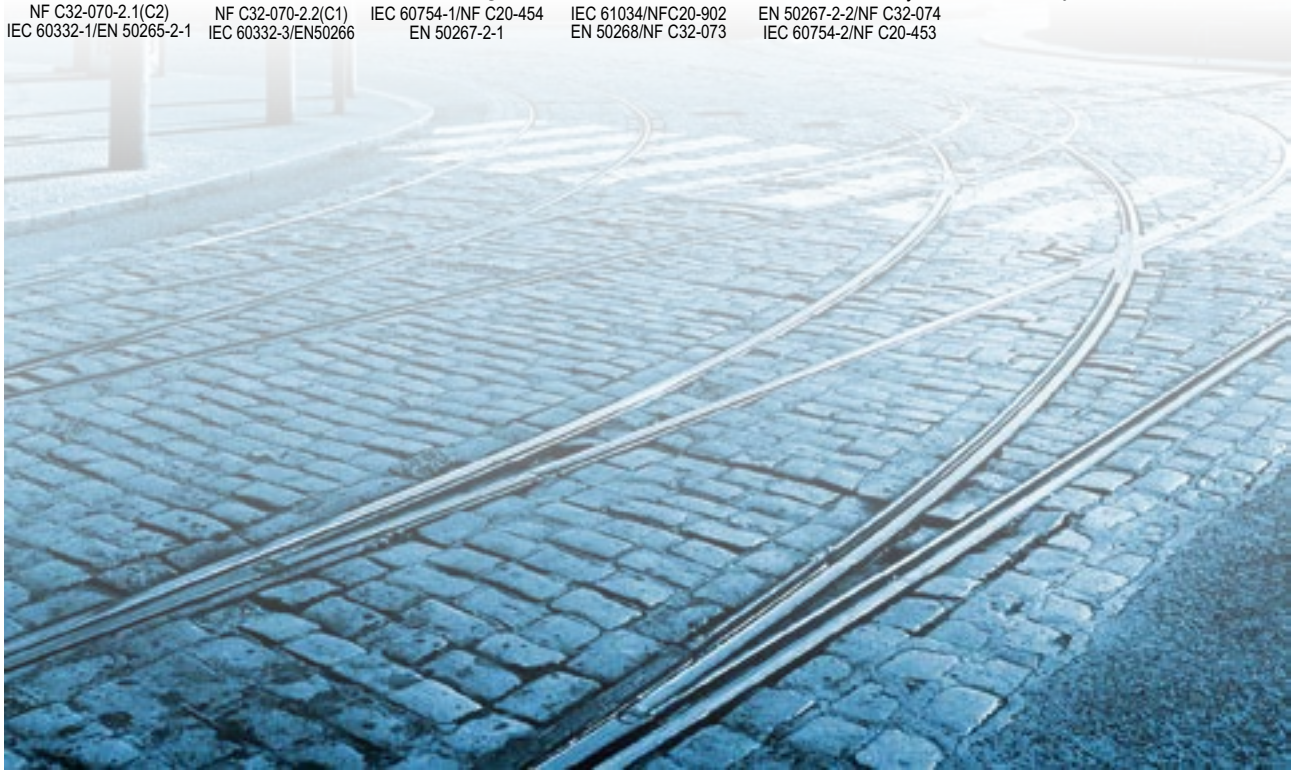


Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity



3.6/6KV Single Core Medium Wall Traction Cables

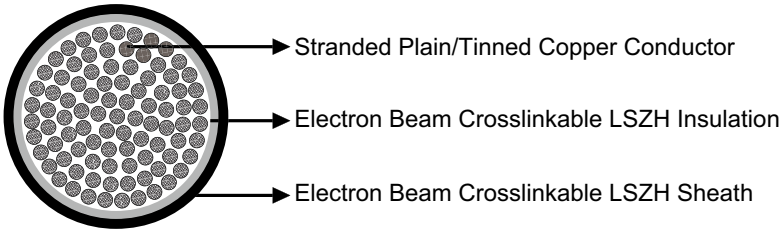
Applications

Single core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts in direct current and alternating voltage technology, especially converter technology

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0

Construction



- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation: Electron beam crosslinkable medium wall LSZH compound.
- Outer sheath: Electron beam crosslinkable LSZH compound.

Optional

FRA-MW-6S-OS (Screened);
FRA-MW-6S-FR(Fire resistant)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5	2.5	4.0	6.0	10	16	25	35	50
Maximum Conductor Resistance	Ω/km	13.7	8.21	5.09	3.39	1.95	1.24	0.795	0.565	0.393
Voltage Rating	KV	3.6/6								

Nominal Conductor Cross Section	mm^2	70	95	120	150	185	240	300	400
Maximum Conductor Resistance	Ω/km	0.277	0.21	0.164	0.132	0.108	0.0817	0.0654	0.0495
Voltage Rating	KV	3.6/6							

Mechanical and Thermal Properties

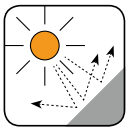
- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

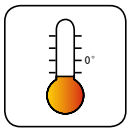
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-MW-6S-1C2.5S	1 x 2.5	50/0.25	2.6	9.4	120
FRA-MW-6S-1C4S	1 x 4.0	56/0.30	2.6	9.9	140
FRA-MW-6S-1C6S	1 x 6.0	84/0.30	2.6	10.4	165
FRA-MW-6S-1C10S	1 x 10.0	80/0.40	2.6	11.3	220
FRA-MW-6S-1C16S	1 x 16.0	126/0.40	2.6	12.5	290
FRA-MW-6S-1C25S	1 x 25.0	196/0.40	2.9	14.9	430
FRA-MW-6S-1C35S	1 x 35.0	276/0.40	2.9	16.2	540
FRA-MW-6S-1C50S	1 x 50.0	396/0.40	2.9	17.8	670
FRA-MW-6S-1C70S	1 x 70.0	360/0.50	2.9	19.6	880
FRA-MW-6S-1C95S	1 x 95.0	475/0.50	2.9	21.2	1100
FRA-MW-6S-1C120S	1 x 120.0	608/0.50	2.9	23.3	1380
FRA-MW-6S-1C150S	1 x 150.0	756/0.50	2.9	24.9	1660
FRA-MW-6S-1C185S	1 x 185.0	925/0.50	3.2	27.3	2010
FRA-MW-6S-1C240S	1 x 240.0	1221/0.50	3.4	30.7	2670
FRA-MW-6S-1C300S	1 x 300.0	1525/0.50	3.4	32.2	3170
FRA-MW-6S-1C400S	1 x 400.0	2013/0.50	3.4	36.6	4150


Impact Resistant


Highly Flexible


UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

3.6/6KV Single Core Dual Wall Traction Cables

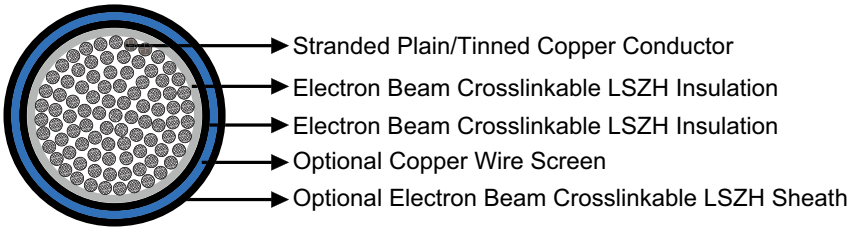
Applications

Single core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts in direct current and alternating voltage technology, especially converter technology

Standard

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0

Construction



- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Insulation1: Electron beam crosslinkable thin wall LSZH compound.
- Insulation2: Electron beam crosslinkable thin wall LSZH compound.
- Screen(optional): Copper wire screen (for screened and sheathed cables)
- Outer Sheath(optional): Electron beam crosslinkable LSZH compound. (for screened and sheathed cables)

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5	2.5	4.0	6.0	10	16	25	35	50
Maximum Conductor Resistance	Ω/km	13.7	8.21	5.09	3.39	1.95	1.24	0.795	0.565	0.393
Voltage Rating	KV	3.6/6								

Nominal Conductor Cross Section	mm^2	70	95	120	150	185	240	300	400
Maximum Conductor Resistance	Ω/km	0.277	0.21	0.164	0.132	0.108	0.0817	0.0654	0.0495
Voltage Rating	KV	3.6/6							

Mechanical and Thermal Properties

- Minimum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Temperature Range: -40℃ to +120℃

Dimensions and Weight

FRA-DW-6SU (Usheathed)

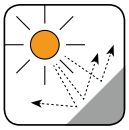
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-DW-6SU-1C1.5S	1 x 1.5	30/0.25	1.4	4.4	20
FRA-DW-6SU-1C2.5S	1 x 2.5	50/0.25	1.5	4.9	50
FRA-DW-6SU-1C4S	1 x 4.0	56/0.30	1.6	5.7	60
FRA-DW-6SU-1C6S	1 x 6.0	84/0.30	1.7	6.3	90
FRA-DW-6SU-1C10S	1 x 10.0	80/0.40	1.8	7.5	140
FRA-DW-6SU-1C16S	1 x 16.0	126/0.40	2.1	9.4	210
FRA-DW-6SU-1C25S	1 x 25.0	196/0.40	2.2	10.9	300
FRA-DW-6SU-1C35S	1 x 35.0	276/0.40	2.4	12.5	410
FRA-DW-6SU-1C50S	1 x 50.0	396/0.40	2.6	14.5	580
FRA-DW-6SU-1C70S	1 x 70.0	360/0.50	2.6	16.5	770
FRA-DW-6SU-1C95S	1 x 95.0	475/0.50	2.8	18.3	1000
FRA-DW-6SU-1C120S	1 x 120.0	608/0.50	2.9	20.6	1260
FRA-DW-6SU-1C150S	1 x 150.0	756/0.50	3.1	22.9	1610
FRA-DW-6SU-1C185S	1 x 185.0	925/0.50	3.3	24.8	1920
FRA-DW-6SU-1C240S	1 x 240.0	1221/0.50	3.4	27.8	2470
FRA-DW-6SU-1C300S	1 x 300.0	1525/0.50	3.6	30.8	3000
FRA-DW-6SU-1C400S	1 x 400.0	2013/0.50	3.7	36.5	4220

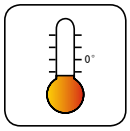
FRA-DW-6S-OS (Screened & Sheathed)

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-DW-6S-OS-1C1.5S	1 x 1.5	30/0.25	1.4	6.6	72
FRA-DW-6S-OS-1C2.5S	1 x 2.5	50/0.25	1.5	7.2	89
FRA-DW-6S-OS-1C4S	1 x 4.0	56/0.30	1.6	8.2	120
FRA-DW-6S-OS-1C6S	1 x 6.0	84/0.30	1.7	9.1	150
FRA-DW-6S-OS-1C10S	1 x 10.0	80/0.40	1.8	10.4	220
FRA-DW-6S-OS-1C16S	1 x 16.0	126/0.40	2.1	12.4	330
FRA-DW-6S-OS-1C25S	1 x 25.0	196/0.40	2.2	14.3	390
FRA-DW-6S-OS-1C35S	1 x 35.0	276/0.40	2.4	15.7	550
FRA-DW-6S-OS-1C50S	1 x 50.0	396/0.40	2.6	17.7	740
FRA-DW-6S-OS-1C70S	1 x 70.0	360/0.50	2.6	20.1	970
FRA-DW-6S-OS-1C95S	1 x 95.0	475/0.50	2.8	22.0	1240
FRA-DW-6S-OS-1C120S	1 x 120.0	608/0.50	2.9	24.7	1510
FRA-DW-6S-OS-1C150S	1 x 150.0	756/0.50	3.1	27.1	1900
FRA-DW-6S-OS-1C185S	1 x 185.0	925/0.50	3.3	29.1	2220
FRA-DW-6S-OS-1C240S	1 x 240.0	1221/0.50	3.4	32.3	2830
FRA-DW-6S-OS-1C300S	1 x 300.0	1525/0.50	3.6	35.6	3520


Impact Resistant


Highly Flexible

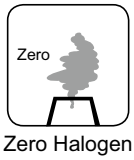

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

300/500V Single Core Thin Wall Fire Resistant Traction Cables

Application

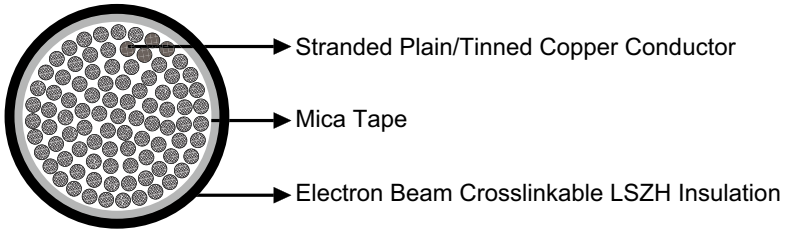
Single Core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts

Standards

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0
- BS6387

Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Flame Barrier: Mica tape
- Insulation: Electron beam crosslinkable thin wall LSZH compound

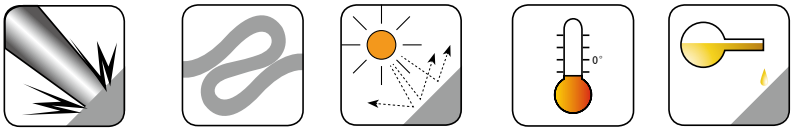


Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	0.5	0.75	1.0	1.5	2.5
Maximum DC Conductor Resistance	Ω/km	40.1	26.7	20.0	13.7	8.21
Voltage Rating	KV	0.45/0.75				

Mechanical and Thermal Properties

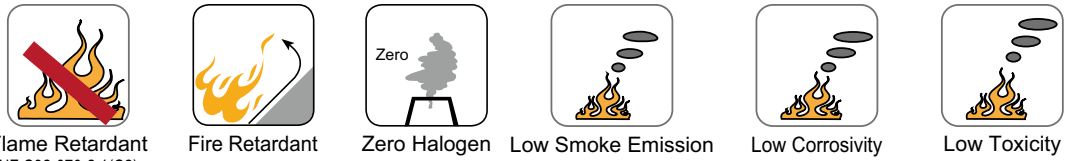
- Miniumum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Operating Temperatures: -40 deg C to +120 deg C



Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-0.5SU-1C0.5S	1 x 0.5	16/0.20	0.30	2.0	8
FRA-TW-0.5SU-1C0.75S	1 x 0.75	24/0.20	0.30	2.25	11
FRA-TW-0.5SU-1C1S	1 x 1.0	32/0.2	0.35	2.50	14
FRA-TW-0.5SU-1C1.5S	1 x 1.5*	30/0.25	0.35	2.8	19
FRA-TW-0.5SU-1C2.5S	1 x 2.5*	50/0.25	0.35	3.2	29

*earth cable (coloured yellow/green) can be offered as an option.



Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

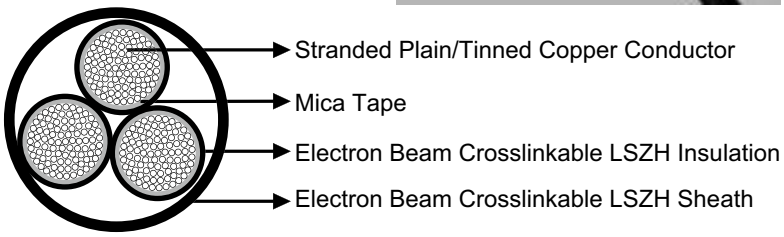
300/500V Multicore Thin Wall Fire Resistant Traction Cables

Application

Single Core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts

Standards

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0
- BS6387



Construction

- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Flame Barrier: Mica tape
- Insulation: Electron beam crosslinkable thin wall LSZH compound
- Sheath: Electron beam crosslinkable LSZH compound

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	0.5	0.75	1.0	1.5	2.5
Maximum DC Conductor Resistance	Ω/km	40.1	26.7	20.0	13.7	8.21
Voltage Rating	KV	0.45/0.75				

Mechanical and Thermal Properties

- Miniumum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Operating Temperatures: -40 deg C to +120 deg C

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-0.5M-FR-3C0.5S	3 x 0.5	16/0.20	0.56	5.8	41
FRA-TW-0.5M-FR-26C0.5S	26 x 0.5	16/0.20	0.56	14.7	297
FRA-TW-0.5M-FR-5P0.5S	5 x 2 x 0.5	16/0.20	0.56	12.9	178
FRA-TW-0.5M-FR-2C0.75S	2 x 0.75	24/0.20	0.58	5.9	40
FRA-TW-0.5M-FR-4C0.75S	4 x 0.75	24/0.20	0.58	7.05	75
FRA-TW-0.5M-FR-8C0.75S	8 x 0.75	24/0.20	0.58	9.3	125

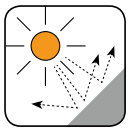
Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-TW-0.5M-FR-2C1S	2 x 1.0	32/0.20	0.63	6.5	61
FRA-TW-0.5M-FR-2C1.5S	2 x 1.5	30/0.25	0.66	7.1	81
FRA-TW-0.5M-FR-3C1.5S	3 x 1.5	30/0.25	0.66	7.7	99
FRA-TW-0.5M-FR-5C1.5S	5 x 1.5*	30/0.25	0.66	9.5	150
FRA-TW-0.5M-FR-6C1.5S	6 x 1.5	30/0.25	0.66	10.7	188
FRA-TW-0.5M-FR-7C1.5S	7 G 1.5	30/0.25	0.66	10.3	190
FRA-TW-0.5M-FR-12C1.5S	12 G 1.5	30/0.25	0.66	13.8	319
FRA-TW-0.5M-FR-20C1.5S	20 x 1.5	30/0.25	0.66	17.8	533
FRA-TW-0.5M-FR-25C1.5S	25 G 1.5	30/0.25	0.66	19.6	630
FRA-TW-0.5M-FR-37C1.5S	37 x 1.5	30/0.25	0.66	22.6	889
FRA-TW-0.5M-FR-3C2.5S	3 G 2.5	50/0.25	0.63	8.5	135
FRA-TW-0.5M-FR-12C2.5S	12 G 2.5	50/0.25	0.63	15.9	460
FRA-TW-0.5M-FR-25C2.5S	25 G 2.5	50/0.25	0.63	22.2	900

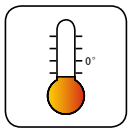
*green/yellow cables can be offered as an option

G:green/yellow cables


Impact Resistant


Highly Flexible

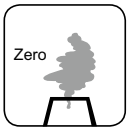

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

0.6/1KV Single Core Medium Wall Fire Resistant Traction Cables

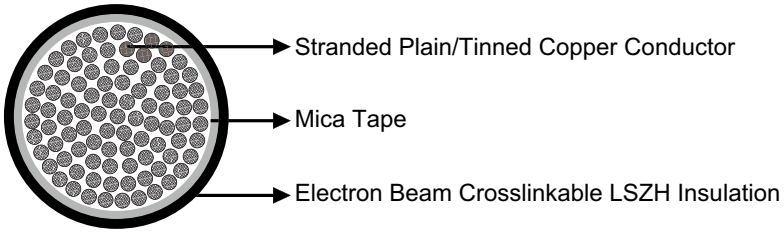
Application

Single Core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts

Standards

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0
- BS6387

Construction



- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Flame Barrier: Mica tape.
- Insulation: Electron beam crosslinkable medium wall LSZH compound.

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.0	1.5	2.5	4.0	6.0	10	16
Maximum DC Conductor Resistance	Ω/km	20	13.7	8.21	5.09	3.39	1.95	1.24
Voltage Rating	KV	0.6/1						

Nominal Conductor Cross Section	mm^2	25	35	50	70	95	150
Maximum DC Conductor Resistance	Ω/km	0.795	0.565	0.393	0.277	0.210	0.132
Voltage Rating	KV	0.6/1					

Mechanical and Thermal Properties

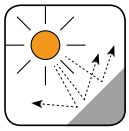
- Miniumum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Operating Temperatures: -40 deg C to +120 deg C

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-MW-1SU-FR-1C1S	1 x 1.0	32/0.2	0.55	3.15	18.8
FRA-MW-1SU-FR-1C1.5S	1 x 1.5	30/0.25	0.55	3.40	24
FRA-MW-1SU-FR-1C2.5S	1 x 2.5	50/0.25	0.60	4.05	36.6
FRA-MW-1SU-FR-1C4S	1 x 4	56/0.3	0.65	4.60	52.5
FRA-MW-1SU-FR-1C6S	1 x 6	84/0.3	0.70	5.30	73
FRA-MW-1SU-FR-1C10S	1 x 10	80/0.4	0.80	6.35	121
FRA-MW-1SU-FR-1C16S	1 x 16	126/0.4	0.90	8.15	181
FRA-MW-1SU-FR-1C25S	1 x 25	196/0.4	1.00	9.65	261
FRA-MW-1SU-FR-1C35S	1 x 35	276/0.4	1.10	10.80	365
FRA-MW-1SU-FR-1C50S	1 x 50	396/0.41	1.20	12.80	530
FRA-MW-1SU-FR-1C70S	1 x 70	360/0.50	1.30	15.10	730
FRA-MW-1SU-FR-1C95S	1 x 95	475/0.50	1.40	17.00	930
FRA-MW-1SU-FR-1C150S	1 x 150	756/0.50	1.60	21.30	1450


Impact Resistant


Highly Flexible

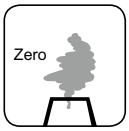

UV Resistant

Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

1.8/3KV Single Core Medium Wall Fire Resistant Traction Cables

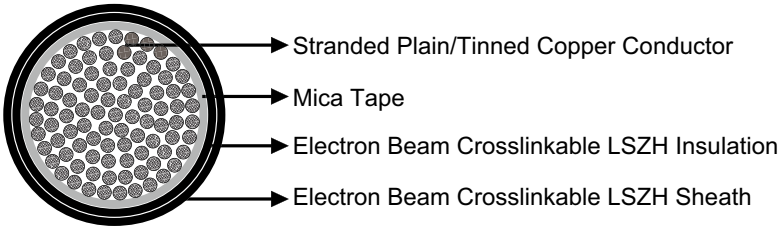
Application

Single Core power and control cable designed for protected, fixed installation inside and outside railway vehicles for connecting fixed and moving parts.

Standards

- BS 6853 -1a
- DIN 5510-1 1-4
- NFF 16-101 F0
- BS6387

Construction



- Conductors: Circular Class 5 stranded plain or tinned copper to BS EN 60228:2005 / BS6360.
- Flame Barrier: Mica tape
- Insulation: Electron beam crosslinkable medium wall LSZH compound
- Sheath: Electron beam crosslinkable LSZH compound

Electrical Characteristics at 20□

Nominal Conductor Cross Section	mm^2	1.5	2.5	4.0	6.0	10	16
Maximum Conductor Resistance	Ω/km	13.7	8.21	5.09	3.39	1.95	1.24
Voltage Rating	KV	1.8/3					

Nominal Conductor Cross Section	mm^2	25	35	50	70	95	120
Maximum Conductor Resistance	Ω/km	0.795	0.565	0.393	0.277	0.21	0.164
Voltage Rating	KV	1.8/3					

Mechanical and Thermal Properties

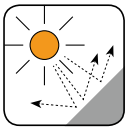
- Miniumum Bending Radius: 3xOD(OD<12mm); 4xOD (OD>12mm)
- Operating Temperatures: -40 deg C to +120 deg C

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Insulation Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-MW-3S-FR-1C1.5S	1 x 1.5	30/0.25	0.8	3.7	26
FRA-MW-3S-FR-1C2.5S	1 x 2.5	50/0.25	0.75	3.95	35
FRA-MW-3S-FR-1C4S	1 x 4	56/0.3	0.95	4.95	55
FRA-MW-3S-FR-1C6S	1 x 6	84/0.3	0.90	5.35	75
FRA-MW-3S-FR-1C10S	1 x 10	80/0.4	1.05	6.80	130
FRA-MW-3S-FR-1C16S	1 x 16	126/0.4	1.20	8.60	190
FRA-MW-3S-FR-1C25S	1 x 25	196/0.4	1.35	10.2	280
FRA-MW-3S-FR-1C35S	1 x 35	276/0.4	1.55	11.7	390
FRA-MW-3S-FR-1C50S	1 x 50	396/0.4	1.85	13.8	550
FRA-MW-3S-FR-1C70S	1 x 70	360/0.5	1.70	15.8	720
FRA-MW-3S-FR-1C95S	1 x 95	475/0.5	1.90	17.6	960
FRA-MW-3S-FR-1C120S	1 x 120	608/0.5	1.95	20.2	1180


Impact Resistant


Highly Flexible

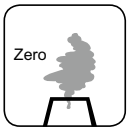

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

FIRERAIL DATABUS CABLES FOR RAILWAY APPLICATIONS

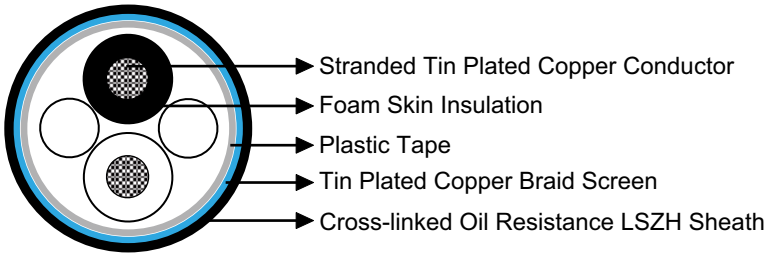
WTB (Wired Train Bus) Cables

Applications

The cables are designed for permanent installation inside of rolling stock to connect fixed parts. A typical application is a communication system in a locomotive. The system uses a wire backed bus system to the TCN standard for control and instrumentation and for diagnostics. This bus system consists of the rail bus WTB (Wired Train Bus) and the road bus MVB (Multifunction Vehicle Bus) which are connected via redundant gateways.

Standards

- DIN 5510-1



Construction

- Conductors: Stranded tin plated copper conductor according to IEC 60228 class 5.
- Insulation: Foam skin-composite PE made of inner cellular layer and outer solid skin
- Core Wrapping: Plastic tape(s).
- EMC Screen: Tin plated copper braid
- Outer Sheath：Cross-linked oil resistant LSZH compound

Electrical Characteristics at 20□

Nominal Cross Section	mm^2	0.75
Maximum Conductor Resistance	Ω/km	26.7
Impedance@1.0-10MHz	Ω	120+/-12
Maximum Attenuation @1MHz	dB/km	10
Maximum Attenuation @1.5MHz	dB/km	13
Maximum Attenuation @2MHz	dB/km	14
Maximum Attenuation @3MHz	dB/km	18
Maximum Transfer Impedance	mΩ/m	30
Nominal Voltage Rating	V	300

Mechanical and Thermal Properties

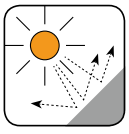
- Minimum Bending Radius: 6xOD (single); 12xOD (multiple)
- Temperature Range: -40℃ to +100℃ (during operation); -20℃ +50℃ (during installation)

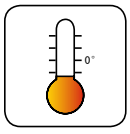
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-WTB-02YSCH-2C0.75S	2 x 0.75	19/0.22	1.4	8.3	97
FRA-WTB-02YSCH-1P0.75S	1 x 2 x 0.75	19/0.22	1.4	9.0	110


Impact Resistant


Highly Flexible


UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

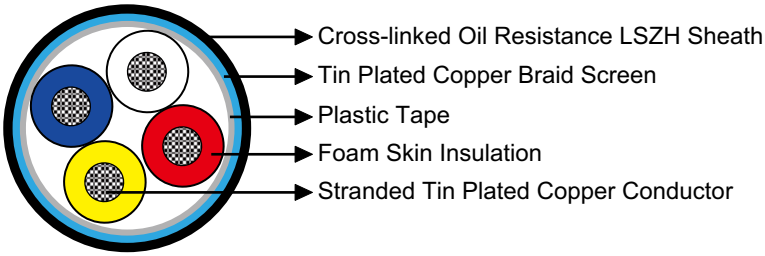
MVB (Multifunction Vehicle Bus) Cables

Applications

The cables are designed for transmission of digital signals under baud rate of 10M inside of rolling stock to connect fixed parts. The communication system in a locomotive uses a wire backed bus system to the TCN standard for control and instrumentation and for diagnostics. This bus system consists of the rail bus WTB (Wired Train Bus) and the road bus MVB (Multifunction Vehicle Bus) which are connected via redundant gateways.

Standards

- DIN 5510-1



Construction

- Conductors: Stranded tin plated copper conductor according to IEC 60228 class 5.
- Insulation: Foam skin-composite PE made of inner cellular layer and outer solid skin
- Core Wrapping: Plastic tape(s).
- EMC Screen: Tin plated copper braid
- Outer Sheath：Cross-linked oil resistant LSZH compound.

Electrical Characteristics at 20□

Nominal Cross Section	mm^2	0.5
Maximum Conductor Resistance	Ω/km	41
Impedance @0.5-2MHz	Ω	120+/-12
Maximum Attenuation @1MHz	dB/km	12.5
Maximum Attenuation @1.5MHz	dB/km	15
Maximum Attenuation @2MHz	dB/km	18
Maximum Attenuation @3MHz	dB/km	21
Maximum Transfer Impedance	mΩ/m	20
Nominal Voltage Rating	V	300

Mechanical and Thermal Properties

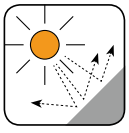
- Minimum Bending Radius: 5xOD (single); 10XOD (multiple)
- Temperature Range: -40℃ to +90℃ (during operation); -20℃ +50℃ (during installation)

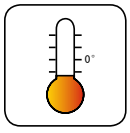
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-MVB-02YS(ST+C)H-1P0.5S+1C0.5S	1 x 2 x 0.5+1 x 0.5	19/0.18	1.2	6.8	62
FRA-MVB-02YS(ST+C)H -2P0.5S	2 x 2 x 0.5	19/0.18	1.2	8.3	100


Impact Resistant


Highly Flexible

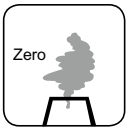

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

MVB (Multifunction Vehicle Bus) Cables (Redundant Version)

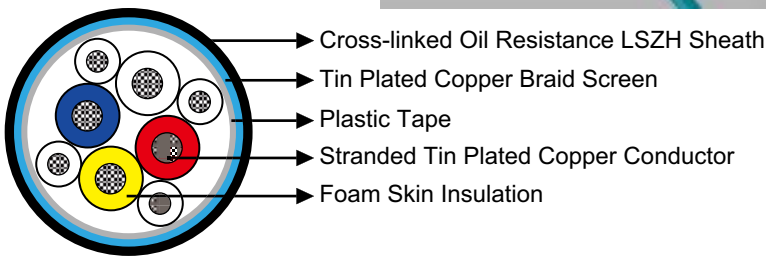
Applications

The cables are designed for permanent installation inside of rolling stock to connect fixed parts. A typical application is a communication system in a locomotive. The system uses a wire backed bus system to the TCN standard for control and instrumentation and for diagnostics. This bus system consists of the rail bus WTB (Wired Train Bus) and the road bus MVB (Multifunction Vehicle Bus) which are connected via redundant gateways.

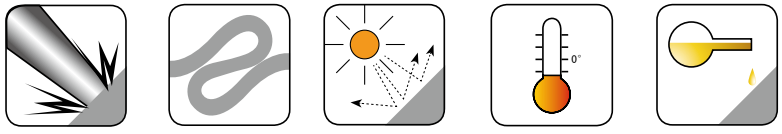
Standards

- DIN 5510-2

Construction



- Conductors: Stranded tin plated copper conductor according to IEC 60228 class 5.
- Insulation: Foam skin-composite PE made of inner cellular layer and outer solid skin
- Core Wrapping: Plastic tape(s).
- EMC Screen: Tin plated copper braid
- Outer Sheath：Cross-linked oil resistant LSZH compound.



Impact Resistant | Highly Flexible | UV Resistant | Weather Resistant | Oil Resistant

Electrical Characteristics at 20□

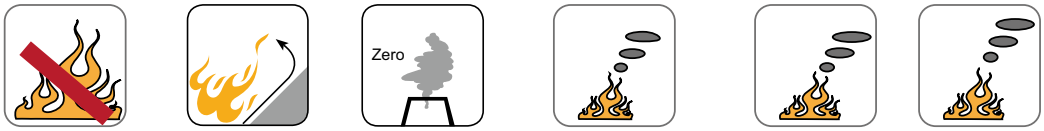
Nominal Cross Section	mm^2	0.5
Maximum Conductor Resistance	Ω/km	41
Impedance @0.75-3MHz	Ω	120+/-12
Maximum Attenuation @1.5MHz	dB/km	17
Maximum Attenuation @3MHz	dB/km	25
Maximum Transfer Impedance	mΩ/m	20
Nominal Voltage Rating	V	300

Mechanical and Thermal Properties

- Minimum Bending Radius: 6xOD (single); 10XOD (multiple)
- Temperature Range: -40℃ to +100℃ (during operation); -20℃ +50℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-MVB-02YS(ST+C)H-1Q0.5S+4C0.25S	1 x 4 x 0.5+4 x 1 x 0.25	19/0.18	1.2	7.9	95



Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1

Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266

Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1

Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073

Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453

Low Toxicity

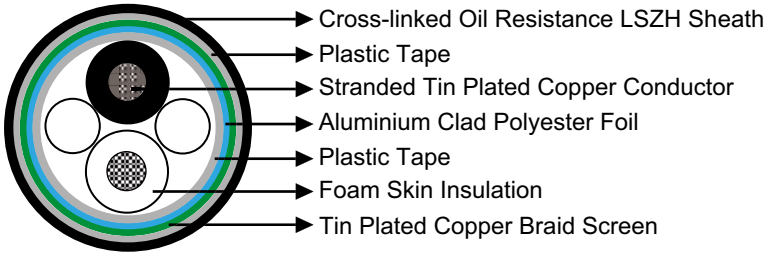
WTB (Wired Train Bus)/MVB (Multifunction Vehicle Bus) Cables

Applications

The cables are used as connecting cables to transmit digital signals inside railway rolling stocks. The communication system in a locomotive uses a wire backed bus system to the TCN standard for control and instrumentation and for diagnostics. This bus system consists of the rail bus WTB (Wired Train Bus) and the road bus MVB (Multifunction Vehicle Bus) which are connected via redundant gateways.

Standards

- DIN 5510-1



Construction

- Conductors: Stranded tin plated copper conductor according to IEC 60228 class 5.
- Insulation: Foam skin-composite PE made of inner cellular layer and outer solid skin
- Cable Element: Twisted pair
- Core Wrapping: Plastic tape(s).
- EMC Screen1: Aluminium clad polyester foil
- EMC Screen2: Tin plated copper braid
- Core Wrapping: Plastic tape(s).
- Outer Sheath：Cross-linked oil resistant LSZH compound.

Electrical Characteristics at 20□

Nominal Cross Section/AWG	mm^2	0.62/20
Maximum Conductor Resistance	Ω/km	33.1
Impedance @0.5-2MHz	Ω	120+/-12
Maximum Attenuation @1MHz	dB/km	10
Maximum Attenuation @2MHz	dB/km	15
Nominal Voltage Rating	V	300

Mechanical and Thermal Properties

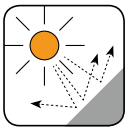
- Minimum Bending Radius: 6xOD (single); 12xOD (multiple)
- Temperature Range: -40℃ to +100℃ (during operation); -20℃ +50℃ (during installation)

Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-WTB/MVB--02YS(ST+C)H-1P20A	1 x 2 x 0.62	19/0.2	1.2	8.3	80


Impact Resistant


Highly Flexible

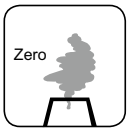

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

Integrated 9/11/18/20 Cores 0.75mm sq UIC Databus Cables

Applications

The cables are used as connecting cables to transmit digital signals inside railway rolling stocks.

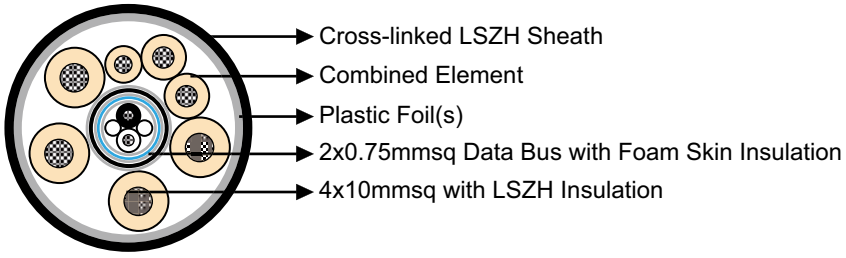
Standards

- DIN 5510-1

Construction

For 9 cores UIC databus cables:

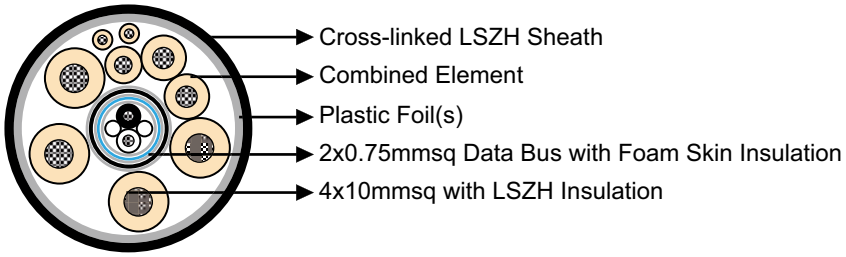
- 4 cores: 10 mm^2 stranded tinned copper conductor with LSZH insulation.
- Combined Element: 3 cores (with Cu-strand 2 x 6mm^2, 1 x 2.5mm^2) are twisted with a filling element to a combined element. Wrapping: Overlapped plastic-foil(s). Elements sheaths: TPE



- UIC Data Bus 0.75mm^2: Two foam skin insulated tinned copper stranded conductors are twisted together with two filling elements to a pair.
- Wrapping: Overlapped plastic-foil(s).
- Screen: Tinned copper wire braid screen
- Element sheaths: TPE.
- Wrapping: Overlapped plastic-foil(s).
- Stranding: 4 strands are twisted to a core together with 3 cored element, the UIC data bus and two fillers
- Core Wrapping: Overlapped plastic-foil(s).
- Outer Sheath：Cross-linked oil resistant LSZH compound.

For 11 cores UIC databus cables:

- 4 cores: 10 mm^2 stranded tinned copper conductor with LSZH insulation.
- Combined Element: 5 cores (with Cu-strand 2 x 6mm^2, 1 x 2.5mm^2 and 2 x 1.0 mm^2) are twisted with a filling element to form a combined element.
- Wrapping: Overlapped plastic-foil(s).



- Elements sheaths: TPE
- UIC Data Bus 0.75mm^2: Two foam skin insulated tinned copper r stranded conductors are twisted together with two filling elements to a pair.
- Wrapping: Overlapped plastic-foil(s).
- Screen: Tinned copper wire braid screen.
- Element sheaths: TPE.
- Wrapping: Overlapped plastic-foil(s).
- Stranding: 4 strands are twisted to a core together with 5 cored element, the UIC data bus and two fillers.
- Core Wrapping: Overlapped plastic-foil(s).

● Outer Sheath：Cross-linked oil resistant LSZH compound

For 18/20 cores UIC databus cables:

● Star Quad: Four LSZH insulated 1mm^2 stranded tinned copper conductors are twisted to form a star quad.

● UIC Data Bus 0.75mm^2: Two foam skin insulated tinned copper stranded conductors are twisted together with two filling elements to form a pair.

● Wrapping: Overlapped plastic-foil(s)

● Screen: Tinned copper wire braid screen

● Element sheaths: TPE.

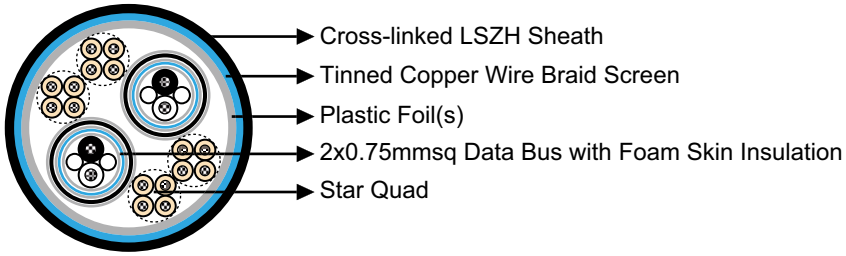
● Wrapping: Overlapped plastic-foil(s)

● Stranding: 4 star quads are stranded together with 2 or 4 UIC data bus cable and several fillers.

● Core Wrapping: Overlapped plastic-foil(s).

● Screen: Tinned copper-wire braid screen.

● Outer Sheath：Cross-linked oil resistant LSZH compound



↘ Electrical Characteristics at 20□

Nominal Cross Section	mm^2	0.75	1	2.5	6	10
No of Strand/Strand Diameter		19/0.22	19/0.25	37/0.29	84/0.3	80/0.4
Maximum Conductor Resistant	Ω/km	26.7	20	8.21	3.39	1.95
Impedance@1.0-10MHz	Ω	120+/-12	-	-	-	-
Maximum Attenuation @1MHz	dB/km	10	-	-	-	-
Maximum Attenuation @1.5MHz	dB/km	13	-	-	-	-
Maximum Attenuation @2MHz	dB/km	14	-	-	-	-
Maximum Attenuation @3MHz	dB/km	18	-	-	-	-
Maximum Transfer Impedance	mΩ/m	30	-	-	-	-
Nominal Voltage Rating	V	300	-	-	-	-

↘ Mechanical and Thermal Properties

● Minimum Bending Radius: 6xOD (single); 12xOD (multiple)

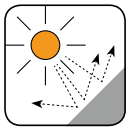
● Temperature Range: -40℃ to +90℃ (during operation); -20℃ +50℃ (during installation)

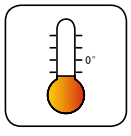
↘ Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-UIC-4C10S+2C6S+1C2.5S+2C0.75S	4 x 10+2 x 6+1 x 2.5+2 x 0.75	1.8	25	917
FRA-UIC-4C10S+2C6S+1C2.5S+2C1S+2C0.75S	4 x 10+2 x 6+1 x 2.5+2 x 1.0+2 x 0.75	1.8	25	969
FRA-UIC-4Q1S+2C0.75S	4 x 4 x 1.0+ 2 x 0.75	1.8	18.5	498
FRA-UIC-4Q1S+2P0.75S	4 x 4 x 1.0+ 2 x 2 x 0.75	1.8	23	530


Impact Resistant


Highly Flexible

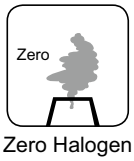

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

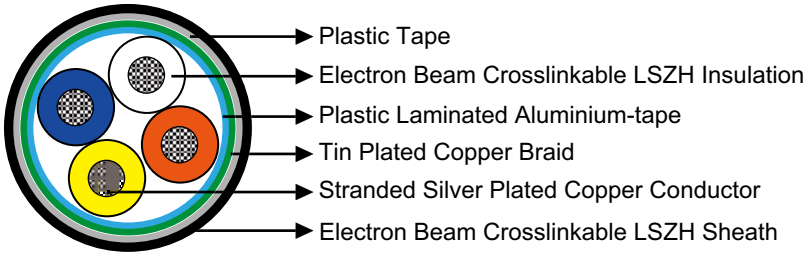
Category 5E Databus Cables

Applications

The cables are designed for permanently protected installation, inside and outside railway rolling stock, buses and other vehicles to connect fixed parts. Ethernet based networks as: infotainment, multimedia, passenger information system etc.

Standards

- DIN 5510-2
- EN 50228-2-2
- BS 6853
- EN 50306-3 par 4.8/4.9/4.10



Construction

For 4 x 0.5, 4 x 22AWG cables:

- Conductors: Stranded tin plated copper conductor (for 0.5mm2 cables) or stranded silver plated copper conductor (for 22AWG cables) according to IEC 60228 class 5.
- Insulation: Electron beam crosslinkable compound
- Cable Element: Individual conductor stranded together
- EMC Screen1: Plastic laminated aluminium-tape.
- EMC Screen2: Tin plated copper braid
- Separator (s)：Plastic tape.
- Outer Sheath：Electron beam crosslinkable compound

For 4 x 2 x 22AWG cables:

- Center: PE filler.
- 4 pairs 2 x 22AWG: Stranded tin plated copper conductor according to IEC 60228 class 5
- Insulation：Electron beam crosslinkable compound
- EMC Screen1：Plastic laminated aluminium-tape.
- EMC Screen2: Tin plated copper braid
- Separator (s)：Plastic tape.
- Outer Sheath：Electron beam crosslinkable compound

Electrical Characteristics at 20□

Nominal Cross Section	mm^2	0.5	-
AWG		-	22
Nominal Conductor Resistance	Ω/km	40.1	54.4
Maximum Resistance Unbalance	Ω/km	1.1	1.1

Maximum Capacitance			
core to core	pF/m	65	65
Core to screen	pF/m	100	100
Characteristic Impedance @100MHz	Ω	100+/-5	100+/-5
Transfer Impedance f≤30MHz	mΩ/m	200	200
Nominal Voltage Rating	V	300	300

Mechanical and Thermal Properties

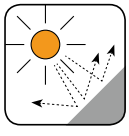
- Minimum Bending Radius: 6xOD
- Temperature Range: -40℃ to +90℃

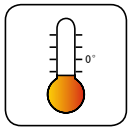
Dimensions and Weight

Cable Code	No. of cores& Nominal Conductor Cross Sectional Area No. x mm^2	Nominal Diameter of Strands No/mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
FRA-Cat5E-4C0.5S	4 x 0.5	19/0.18	1.2	8.3	102
FRA-Cat5E-4C22A	4 x 22AWG	19/0.16	1.2	7.25	81
FRA-Cat5E-4P22A	4 x 2 x 22AWG	19/0.16	1.2	12.6	174


Impact Resistant


Highly Flexible

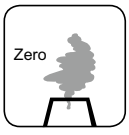

UV Resistant


Weather Resistant


Oil Resistant


Flame Retardant
NF C32-070-2.1(C2)
IEC 60332-1/EN 50265-2-1


Fire Retardant
NF C32-070-2.2(C1)
IEC 60332-3/EN50266



Zero Halogen
IEC 60754-1/NF C20-454
EN 50267-2-1


Low Smoke Emission
IEC 61034/NFC20-902
EN 50268/NF C32-073


Low Corrosivity
EN 50267-2-2/NF C32-074
IEC 60754-2/NF C20-453


Low Toxicity

ORDERING INFORMATION

Ordering Code for Railway Signalling Cables (RAILSIG Series)

↘ RSA/B-CDEFGHIJ-K-LMNO

A. Design Standard

107y: DLK 1.013.107y Standard
108y: DLK 1.013.108y Standard
109y: DLK 1.013.109y Standard
110y: DLK 1.013.110y Standard
00014: NR/PS/TEL/00014 Standard (formerly RT/E/PS/00014)
27220: NR/PS/ELP/27220 Standard (formerly RT/E/PS/0034)
1932: BR1932 Standard
7621A2/T1: LUL G7621 A2 Type 1 Standard (for PVC Sheath)
7621A2/T2: LUL G7621 A2 Type 2 Standard (for LSZH Sheath)
7622A1/T1: LUL G7622 A1 Type 1 Standard (for PVC Sheath)
7622A1/T2: LUL G7622 A1 Type 2 Standard (for LSZH Sheath)
7623A2: LUL G7623 A2 Standard
2029：TR2029 Standard

B Basic Type

A-：Outdoor Cables
AJ-：Outdoor Cables with inductive protection
CV: Unsheathed Board Wiring Cables (French Railway Standard)
CV-S: Unsheathed Flexible Board Wiring Cables (French Railway Standard)
CVZ: Sheathed Board Wiring Cables (French Railway Standard)
CVZ-S: Sheathed Flexible Board Wiring Cables (French Railway Standard)
ZUG: Multipair Internal Equipment Cables (French Railway Standard)
ZUT: Multipair Screened Internal Equipment Cables (French Railway Standard)
SUG: Multicore Internal Equipment Cables (French Railway Standard)
SCG: Local Control Cables (French Railway Standard)
A1: Unsheathed EPR/LSZH Insulated Railway Signalling Cables (UK Network Rail Standard)
A2: EPR/LSZH Insulated & LSZH Sheathed Single Core Railway Signalling Cables (UK Network Rail Standard)
A3: EPR/LSZH Insulated & LSZH Sheathed Multicore Railway Signalling Cables (UK Network Rail Standard)
B1: EPR Insulated & HDPCP Sheathed Single Core Class 2 Stranded Railway Signalling Cables (UK Network Rail Standard)
B2: EPR Insulated & HDPCP Sheathed Multicore Class 2 Stranded Railway Signalling Cables (UK Network Rail Standard)
C1: EPR Insulated & HDPCP Sheathed Single Core Class 5 Stranded Railway Signalling Cables (UK Network Rail Standard)

C2: EPR Insulated & HDPCP Sheathed Multicore Class 5 Stranded Railway Signalling Cables (UK Network Rail Standard)

C3: EPR Insulated & HDPCP Sheathed Single Pair Screened Class 5 Stranded Railway Signalling Cables (UK Network Rail Standard)

D1: EPR/LSZH Insulated & LSFROH Sheathed Single Core Class 2 Stranded Railway Signalling Cables (UK Network Rail Standard)

D2: EPR/LSZH Insulated & LSZH Sheathed Multicore Class 2 Stranded Railway Signalling Cables (UK Network Rail Standard)

E1: EPR/LSZH Insulated & LSZH Sheathed Single Core Class 5 Stranded Railway Signalling Cables (UK Network Rail Standard)

E2: EPR/LSZH Insulated & LSZH Sheathed Multicore Class 5 Stranded Railway Signalling Cables (UK Network Rail Standard)

EAPSP: Steel Tape Armoured Railway Signalling Cables (Spainish Railway Standard)

EAPSP-R: Steel Tape Armoured Jelly Filled Railway Signalling Cables (Spainish Railway Standard)

CCPSSP-FR0.3: Anti Induction PE Sheathed Railway Signalling Cables with Reduction Factor 0.3 (Spainish Railway Standard)

CCPSSP-FR0.1: Anti Induction PE Sheathed Railway Signalling Cables with Reduction Factor 0.1 (Spainish Railway Standard)

CCPSSP-R-FR0.1: Anti Induction PE Sheathed Jelly Filled Railway Signalling Cables with Reduction Factor 0.1 (Spainish Railway Standard)

CCTSST-FR0.1: Anti Induction FRNC-PE Sheathed Railway Signalling Cables with Reduction Factor 0.1 (Spainish Railway Standard)

CCTSST-FR0.3: Anti Induction FRNC-PE Sheathed Railway Signalling Cables with Reduction Factor 0.3 (Spainish Railway Standard)

ZPAU: Anti Induction PE Sheathed Copper Tape Screened Multipair Railway Signalling Cables (French Railway Standard)

ZPFU: Anti Induction PE Sheathed Unscreened Multipair Railway Signalling Cables (French Railway Standard)

ZPGU: PE Sheathed Multipair Railway Signalling Cables (French Railway Standard)

ZCO3: Anti Induction PE Sheathed Multiquad Railway Signalling Cables (French Railway Standard)

K23: Anti Induction LSZH Sheathed Multiquad Subway Signalling Cables (French Railway Standard)

K24: LSZH Sheathed Multipair LSZH Sublway Signalling Cables (French Railway Standard)

K13: PVC Sheathed Multipair LSZH Sublway Signalling Cables (French Railway Standard)

DIG: Digicode 30KHz Indoor Signalling Cables (French Railway Standard)

SXCAV & SXCAG: Switching Centre Signalling Cables (Belgium Railway Standard)

SW: Switching Centre Signalling Cables (Swiss Railway Standard)

RT/F3-D type: Unarmoured PE/LSZH Sheathed Axle Counter Cables (UK Network Rail Standard)

RT/F3-S type: Steel Tape Armoured PE/LSZH Sheathed Axle Counter Cables (UK Network Rail Standard)

RT/F3-B type: Brass Tape Armoured PE/LSZH Sheathed Axle Counter Cables (UK Network Rail Standard)

RT/F3-R type: Ruggedised PE Sheahed Axle Counter Cables (UK Network Rail Standard)

RT/F3-S/E1: PE/LSZH Sheathed Axle Counter Cables Reduction Factor 0.65 (UK Network Rail Standard)

RT/F3-S/E2: PE/LSZH Sheathed Axle Counter Cables Reduction Factor 0.45 (UK Network Rail Standard)

RT/F3-S/E3: PE/LSZH Sheathed Axle Counter Cables Reduction Factor 0.2(UK Network Rail Standard)

SPFB: Speed Control System Balise Cables (French KVB System)

SIF: Speed Control Eurobalise Cables (European ERTMS System)

BGA: Speed Control Eurobalise Cables (European ERTMS System)

K27: Fire Resistant Silicon Rubber Insulated LSZH Sheathed Signalling Cables

MD4 Fire Resistant Mica Tape Insulated LSZH Sheathed Railway Signalling Cables

RT/ZHLS: LSZH Sheathed Trackside Telephone Cables

C Insulation

02Y: Cellular PE

2Y: Solid PE

02YS: Foam Skin (Cellular / Solid PE Dual Layer)

Y: PVC

2G: Silicone Rubber

3G: EPR

H: LSZH

D Filling

(F): Petroleum Jelly Filling

Blank: Unfilled

E Screening

(St): Static shield of plastic-backed aluminium tape

Blank: No screen

F Bedding

2Y: PE

Y: PVC

H: LSZH

(L)2Y: Aluminium/PE Laminated sheath

Blank: No Inner Sheath

G Electrostatic Shield

D: Copper wire concentric screen

(K): Copper tape screen

C: Copper wire braid screen

(...Cu): Total cross section of copper shield in mm sq

H Electromagnetic Shield

B: Single / Double layer of Galvanised Steel Tape Armor

(1B... 0.5): One Layer of Helically Applied Steel Tape, thickness of Steel Tape in 0.5 mm.

(1B... 0.8): One Layer of Helically Applied Steel Tape, thickness of Steel Tape in 0.8 mm.

(2B... 0.5): Two Layers of Helically Applied Steel Tape, thickness of Steel Tape in 0.5 mm.

(2B... 0.8): Two Layers of Helically Applied Steel Tape, thickness of Steel Tape in 0.8 mm.

I Armoring

b: Steel Tape Armoring

SR- Corrugated Steel Tape Armouring

Blank: No Armour

J Sheath

2Y: PE

2Yv: Reinforced PE Sheath

Y: PVC

H: LSZH

Hv: Reinforced LSZH Sheath

5G: HDPCP

4Y: PA Sheath

K No of Cores/ Pairs/Quads x Conductor Diameter / Number of Cores/Pairs/Quads x Cross Section

NC0.9: N Cores x 0.9mm

NC1.4: N Cores x 1.4mm

NC1.8: N Cores x 1.8mm

NP0.9: N Pairs x 0.9mm

NP1.4: N Pairs x 1.4mm

NP1.8: N Pairs x 1.8mm

NQ0.9: N Quads x 0.9mm

NQ1.4: N Quads x 1.4mm

NQ1.8: N Quads x 1.8mm

NC0.5S: N Cores x 0.5 mm sq

NP1.0S: N Pairs x 1.0 mm sq

NQ1.5S: N Quads x 1.5 mm sq

L Cable Category

S- Signal Cables

M Types of Stranding

Bd: Twisted in layers

Lg: Twisted in units

N Operating Capacity / Mutual Capacitance

H145: Mutual Capacitance of 145nF/Km

H115: Mutual Capacitance of 115nF/Km

H95: Mutual Capacitance of 95nF/Km

H45: Mutual Capacitance of 45nF/Km

O Reduction Factor

R4: R401 Series (Reduction Factor 0.15)

R5: R501 Series (Reduction Factor 0.35)

R6: R601 Series (Reduction Factor 0.55)

P Fire Retardance & Resistance Options

I1: Fire propagation to IEC 60332-1

I3C: Fire propagation to IEC 60332-3C

E30: 30 mins Circuit integrity according to DIN 4102 Part 12

E60: 60 mins Circuit integrity according to DIN 4102 Part 12

E180: 180 mins Circuit integrity according to DIN 4102 Part 12

B6387CWZ: BS6387 CWZ

Ordering Code for Railway Control & Power Cables (RAILFEEDER Series)

↘ RFA/B-C-DEFG-HI-J

A. Design Standard

55625: NF F 55-625 Standard

21101: RT/E/S/21101 Standard

14025: EME-SP-14-025 / SE908Standard

14026: EME-SP-14-026 Standard

14027: EME-SP-14-027 Standard

14028: EME-SP-14-028 Standard

260: SE260 Standard

774: SE774 Standard

895: SE895 Standard

902: SE902 Standard

1047: SE1047 Standard

LU12: LU Section 12 Standard

880: BR880 Standard

40045: NR/S/ELP 40045 Standard

00008: NR/PS/00008 Standard

7835: BS 7835 Standard

6622: BS 6622 Standard

7655: BS 7655 Standard

31102: NR/PS/TEL/31102 (BR1817) Standard

B. Basic Types

K25: Class 2 plain copper conductor to IEC 60228, XLPE Insulated, steel tape armoured and low smoke halogen free polyolefin sheathed trackfeeder cables

NSGAFOU: Single Core EPR insulated and PCP sheathed cable

H07RN-F: 450/750V EPR insulated and PCP sheathed cables

H01N2-D: 450/750V CSP sheathed welding cables, HOFR, heat resistant, oil resistant and flame retardant

VV-U: Class 2 plain copper conductor to IEC 60228, PVC insulated and PVC sheathed cables

VV-K: Class 5 flexible plain copper conductor to IEC 60228, PVC insulated and PVC sheathed cables

Z1Z1-U: Class 2 plain copper conductor to IEC 60228, low smoke halogen free polyolefin insulated and low smoke halogen free polyolefin sheathed cables

Z1Z1-K: Class 5 flexible plain copper conductor to IEC 60228, low smoke halogen free polyolefin insulated and low smoke halogen free polyolefin sheathed cables

RZ1-U(AS): Class 2 plain copper conductor to IEC 60228, XLPE insulated and low smoke halogen free polyolefin sheathed safety cables

RZ1-K(AS): Class 5 flexible plain copper conductor to IEC 60228, XLPE insulated and low smoke halogen free polyolefin sheathed safety cables

ES07Z-U(AS): 450/750V Class 2 plain copper conductor to IEC 60228, low smoke halogen free polyolefin insulated safety cables, unsheathed

ES07Z-K(AS): 450/750V Class 5 flexible plain copper conductor to IEC 60228, low smoke halogen free polyolefin insulated safety cables, unsheathed.

DZ1-U(AS): Class 2 plain copper conductor to IEC 60228, EPR insulated and low smoke halogen free polyolefin sheathed safety cables

DZ1-K(AS): Class 5 flexible plain copper conductor to IEC 60228, EPR insulated and low smoke halogen free polyolefin sheathed safety cables.

DOZ1-U(AS): Class 2 plain copper conductor to IEC 60228, EPR insulated, aluminum/polyester tape screened and low smoke halogen free polyolefin sheathed high safety cables

DOZ1-K(AS): Class 5 flexible plain copper conductor to IEC 60228, EPR insulated , aluminum/polyester tape screened and low smoke halogen free polyolefin sheathed high safety cables

SZ1-U(AS+): Class 2 plain copper conductor to IEC 60228, silicon rubber insulated and low smoke halogen free polyolefin sheathed high safety cables

SZ1-K(AS+): Class 5 flexible plain copper conductor to IEC 60228, silicon rubber insulated and low smoke halogen free polyolefin sheathed high safety cables.

SOZ1-U PH90 (AS+): Class 2 plain copper conductor to IEC 60228, silicon rubber insulated, aluminum/polyester tape screened and low smoke halogen free polyolefin sheathed high safety cables with fire resistance to EN 50200 PH 90

SOZ1-K PH 90 (AS+): Class 5 flexible plain copper conductor to IEC 60228, silicon rubber insulated , aluminum/polyester tape screened and low smoke halogen free polyolefin sheathed high safety cables with fire resistance to EN 50200 PH 90

MICC: Solid plain annealed copper, magnesium oxide insulated and copper sheathed fire resistant cables.

RZ1MZ1-U (AS): Class 2 plain copper conductor to IEC 60228, XLPE Insulated. steel wire armoured and low smoke halogen free polyolefin sheathed safety cables

RZ1MZ1-K(AS): Class 5 flexible plain copper conductor to IEC 60228, XLPE Insulated, steel wire armoured and low smoke halogen free polyolefin sheathed safety cables

RZ1MZ1-U MICA (AS+): Class 2 plain copper conductor to IEC 60228, MICA/XLPE Insulated., steel wire armoured and low smoke halogen free polyolefin sheathed safety cables

RZ1MZ1-K MICA (AS+): Class 5 flexible plain copper conductor to IEC 60228, MICA/XLPE Insulated, steel wire armoured and low smoke halogen free polyolefin sheathed safety cables

RZ1F3Z1-U(AS): Class 2 plain copper conductor to IEC 60228, XLPE Insulated, steel tape armoured and low smoke halogen free polyolefin sheathed safety cables

RZ1F3Z1-K(AS): Class 5 flexible plain copper conductor to IEC 60228, XLPE Insulated, .steel tape armoured and low smoke halogen free polyolefin sheathed safety cables

VC4VV-U: Class 2 plain copper conductor to IEC 60228, PVC insulated, copper wire braided, PVC inner sheathed and PVC over sheathed concentric cables

RC4Z1Z1-U: Class 2 plain copper conductor to IEC 60228, XLPE insulated, copper wire braided, low smoke halogen free polyolefin inner sheathed and low smoke halogen free polyolefin over sheathed concentric cables

VC4VC4V-U: Class 2 plain copper conductor to IEC 60228, PVC insulated, copper wire spiral screened, PVC inner sheathed, copper wire braided and PVC over sheathed concentric cables

RC4Z1C4Z1-U: Class 2 plain copper conductor to IEC 60228, XLPE insulated, copper wire spiral screened, low smoke halogen free polyolefin inner sheathed, copper wire braided and low smoke halogen free polyolefin over sheathed concentric cables

RHZ1 H16- Class 2 plain copper conductor to IEC 60228, semi conducting conductor screen, XLPE insulated, semi conducting insulation screen, copper wire + copper tape screened and low smoke halogen free polyolefin sheathed medium voltage cables

RHZ1MZ1: Class 2 plain copper conductor to IEC 60228, semi conducting conductor screen, XLPE insulated, semi conducting insulation screen, individual and overall copper tape screened, low smoke halogen free polyolefin inner sheathed, steel wire armoured and low smoke halogen free polyolefin sheathed medium voltage cables

RHVMV: Class 2 plain copper conductor to IEC 60228, semi conducting conductor screen, XLPE insulated, semi conducting insulation screen, individual and overall copper tape screened, PVC inner sheathed, steel wire armoured and PVC sheathed medium voltage cables

XKDT: Class 2 plain copper conductor to IEC 60228, semi conducting conductor screen, XLPE insulated, semi conducting insulation screen, copper wire screened, longitudinal watertight and PE sheathed medium voltage cables

XKDT-YT: Class 2 plain copper conductor to IEC 60228, semi conducting conductor screen, XLPE insulated, semi conducting insulation screen, three twisted single core, copper wire screened, longitudinal watertight and HDPE sheathed medium voltage cables

XKDT-FT: Class 2 plain copper conductor to IEC 60228, semi conducting conductor screen, XLPE insulated, semi conducting insulation screen, three twisted single core, copper wire screened, galvanized steel flat wire armoured, longitudinal watertight and PE sheathed medium voltage cables

C Voltage Rating

300/500V: 300/500V; 450/750V-450/750V; 0.6/1KV: 600/1000V; 300N-300V DC Negative; 1800P-1800V DC Positive

6.35/11KV: 6.35/11KV; 11/33KV-11/33KV

H: No of Cores x Conductor Diameter / Number of Cores x Cross Section

3G0.5S: 3 Cores x 0.5 mm sq

I Conductor Type

AL: Aluminium CU: Copper

J Fire Retardance & Resistance Options

FR: Fire Resistant
I1: Fire propagation to IEC 60332-1
I3C: Fire propagation to IEC 60332-3C
E30: 30 mins Circuit integrity according to DIN 4102 Part 12
E60: 60 mins Circuit integrity according to DIN 4102 Part 12
E180: 180 mins Circuit integrity according to DIN 4102 Part 12
B6387CWZ: BS6387 CWZ

Ordering Code for Railway Traction Cables (FIRERAIL Series)

↘ FRA-A-BC-D-E-F-G

A Wall Type

SW: Standard Wall
MW: Medium Wall
TW: Thin Wall
HT: High Temperature

B Voltage Type

0.5: 300/500V
1: 0.6/1KV
3: 1.8/3KV
6: 3.6/6KV

C Core Type

S: Single Core
M: Multi Core
MP: Multi Pair

D Insulation or Sheath Type

U: Unsheathed
SW: Standard Wall Sheath
ESW: Exposed Standard Wall Sheath
RI: Reinforced Insulation

E Screen Type

OS: Overall Screen
IOS: Individual & Overall Screen

F Number of Cores and Pairs

10C: 10 Cores

G: Cross Section Areas

1.5S: 1.5mm^2

Ordering Code for Railway Fiber Optic Cables (RAILOPTIC Series)

➘ Central Loose Tube Cable

➘ RO/A-CL-B-C-D-E-F-G-H-I-J-K

A; Cable Category

K209A/B: Railway Fiber Optic Cables
2328: SNCF CT2328 / SNCT CT 2329
2513: SNCF CT2513-99 / SNCT CT 2513-99
2242: SNCF CT2242.6.1

B: Loose tube diameter

A=2.1mm, B=2.5mm

C: Fiber type

0=Fiber and copper conductors in cable
4=50/125 multi-mode fiber (OM3) per ITU-T G.651
5=50/125 multi-mode fiber (OM2) per ITU-T G.651
6=62.5/125 multi-mode fiber (OM1) per ITU-T G.651
7=NZDS SM fiber per ITU-T G.656.
8=NZDS SM fiber per ITU-T G.655.
9=Standard SM fiber per ITU-T G.652.D
Ended with R=Ribbon type fiber (Ex: 9R= SM fiber per G.652.D ribbon type)

D: No. of fibers:

1 to 24

E: Bedding

2Y=PE, Y=PVC, H=LSZH

F: Armour

Blank=No armour, T=Corrugated steel tape armour, W=Steel wire armour
B=Bronze armour, D=Fiber glass armour; TW= Steel tape + Steel wire armour

G: Sheath

2Y=PE, Y=PVC, H=LSZH, 11Y=PU, A=Aluminium moisture barrier,
T=Anti-termite protection

H: Water-blocking options for cable core

X=No water-blocking; J= Water blocking gel in tubes;
JD=Water-blocking gel in tubes + dry water blocking in cable core interstices;
JJ= Water-blocking gel in tubes and cable core interstices.

I: Water-blocking options for cables with more than one jacket

X=No water-blocking, J= Water blocking gel between jackets;
D=Dry water-blocking between cable jackets;

J: Strength member

A=Aramid yarn, AG=Aramid yarn and fiberglass yarn, G=Fiberglass yarn

K: General options

SS=Fig-8 self-supporting

↘ Multi Loose Tube Cable

↘ RO/A-ML-B-C-DxE-F-G-H-IJ-K-L-M

A; Cable Category

K209A/B: Railway Fiber Optic Cables
2328: SNCF CT2328 / SNCT CT 2329
2513: SNCF CT2513-99 / SNCT CT 2513-99
2242: SNCF CT2242.6.1

B: Loose tube diameter

B=2.1mm, C=2.5mm, D=2.8mm, E=3.0mm, F=3.2mm

C: Fiber type

0=Fiber and copper conductors in cable
4=50/125 multi-mode fiber (OM3) per ITU-T G.651
5=50/125 multi-mode fiber (OM2) per ITU-T G.651
6=62.5/125 multi-mode fiber (OM1) per ITU-T G.651
7=NZDS SM fiber per ITU-T G.656.
8=NZDS SM fiber per ITU-T G.655.
9=Standard SM fiber per ITU-T G.652.D
Ended with R=Ribbon type fiber (Ex: 9R= SM fiber per G.652.D ribbon type)

D: No. of tubes:

1 to 36

E: No. of fibers per tubes:

2 to 12

F: Central member

S=Solid steel, SR=Stranded steel, F=Fiber Reinforced Plastic (FRP)

G: Bedding

2Y=PE, Y=PVC, H=LSZH

H: Armour

Blank=No armour, STA=Corrugated steel tape armour, SWA=Steel wire armour
B=Bronze armour, F=Fiber glass armour; TW= Steel tape + Steel wire armour

I: Sheath

2Y=PE, Y=PVC, H=LSZH,
11Y=PU, A=Aluminium moisture barrier, T=Anti-termite protection

J: Water-blocking options for cable core

X=No water-blocking; J= Water blocking gel in tubes;
JD=Water-blocking gel in tubes + dry water blocking in cable core interstices;
JJ= Water-blocking gel in tubes and cable core interstices.

K: Water-blocking options for cables with more than one jacket

X=No water-blocking, J= Water blocking gel between jackets;
D=Dry water-blocking between cable jackets;

L: Strength member

A=Aramid yarn, AG=Aramid yarn and fiberglass yarn, G=Fiberlass yarn

M: General options

SS=Fig-8 self-supporting

Ordering Code for Railway Coaxial Cables (RAILCOX Series)

↘ RS/A-B

A Basic Type

K26: 50/75 Ohm Coaxial Cables

B Cable Category

HCAAYZ-50-6 (1/4″): Copper clad aluminium or copper (inner conductor) + annular corrugated copper tube (outer conductor) 50 Ohm 1/4″ foam dielectric flexible feeder coaxial cable

HCAAYZ-50-8 (3/8″): Copper clad aluminium or copper (inner conductor) + annular corrugated copper tube (outer conductor) 50 Ohm 3/8″ foam dielectric flexible feeder coaxial cable

HCAAYZ-50-12 (1/2″): Copper clad aluminium (inner conductor) + annular corrugated copper tube (outer conductor) 50 Ohm 1/2″ foam dielectric flexible feeder coaxial cable

HCTAYZ-50-22 (7/8″): Copper tube (inner conductor) + annular corrugated copper tube (outer conductor) 50 Ohm 7/8″ foam dielectric flexible feeder coaxial cable

HCTAYZ-50-32 (1'1/4): Copper tube (inner conductor) + annular corrugated copper tube (outer conductor) 50 Ohm 1'1/4 foam dielectric flexible feeder coaxial cable

HHTAYZ-50-42 (1'5/8): Helical corrugated copper tube (inner conductor) + annular corrugated copper tube (outer conductor) 50 Ohm 1'5/8 foam dielectric flexible feeder coaxial cable

HRYZ-50-5 (1/4"SF): Copper wire (inner conductor) + helical corrugated copper tube (outer conductor) 50 Ohm 1/4″ foam dielectric super flexible feeder coaxial cable

HRCAYZ-50-7 (3/8″ SF): Copper clad aluminium or copper (inner conductor) + helical corrugated copper tube (outer conductor) 50 Ohm 3/8″ foam dielectric super flexible feeder coaxial cable

HRCAYZ-50-9 (1/2″ SF): Copper clad aluminium (inner conductor) + helical corrugated copper tube (outer conductor) 50 Ohm 1/2″ foam dielectric super flexible feeder coaxial cable

HRCTYZ-50-22 (7/8″ SF): Copper tube (inner conductor) + helical corrugated copper tube (outer conductor) 50 Ohm 7/8″ foam dielectric super flexible feeder coaxial cable

HRYZ-50-5 (1/4″ XF) : Copper wire (inner conductor) + helical corrugated copper tube (outer conductor) 50 Ohm 1/4″ foam dielectric extra flexible feeder coaxial cable

HRCAYZ-50-7 (3/8″ XF)：Copper clad aluminium or copper (inner conductor) + helical corrugated copper tube (outer

conductor) 50 Ohm 3/8″ foam dielectric extra flexible feeder coaxial cable

Ordering Code Railway Databus Cables (FIRERAIL DATABUS Series)

↘ RD/A-BC-DEFGH

A Basic Type

L120: Railway F/FTP Data Cables
K20: Steel Wire Braided Railway F/FTP Data Cables
WTB: Wired Train Bus
MVB: Multifunction Vehicle Bus

B Construction Type

F/UTP: Overall Aluminium/Polyester Screening
F/FTP: Individual Aluminium/Polyester Screening + Overall Aluminium/Polyester Screening
U/FTP: Individual Aluminium/Polyester Screening

C Cable Category

Cat5E: Cat 5E Type
Cat6: Cat6 Type
Cat6A: Cat 6A Type
RS485: RS 485 Type

D Insulation

02Y: Cellular PE
2Y: Solid PE
02YS: Foam Skin (Cellular / Solid PE Dual Layer)

E Screening Material

(St): Overall Shielded with Aluminium/Polyester Tape Shielded
C: Overall Shielded with Copper Wire Braid
PiC: Pairs Shielded with Copper Wire Braid
PiMF: Pairs Shielded with Aluminium/polyester Tape

F Armoring

SWB: Steel Wire Braid Armoring
SWA: Steel Wire Armoring
STA: Steel Tape Armoring
Blank: No Armour

G Sheath

2Y: PE
Y: PVC
H: LSZH

H No of Pairs x Conductor Diameter

4P0.56: 4 Pairs x 0.56mm
4P0.6: 4 Pairs x 0.6mm

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