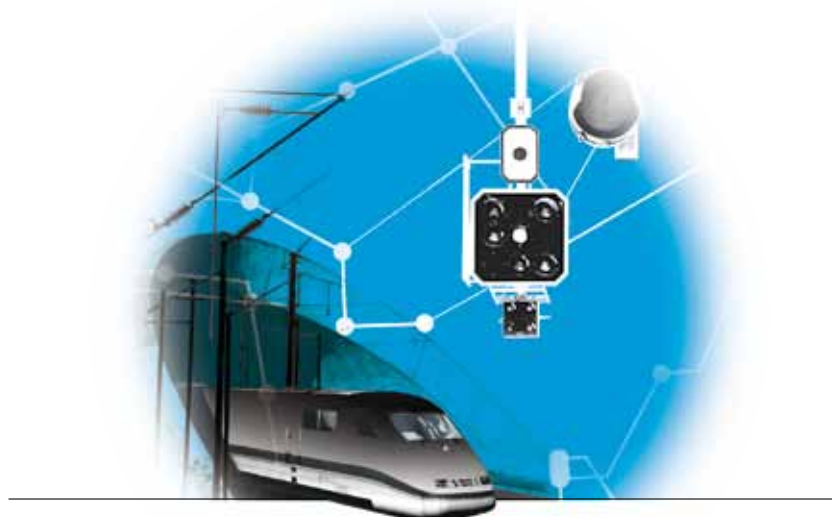


Nexans



**Cable expertise
to contribute to your railway network security**

Nexans helps you create the network you need for growth



Nexans produces a wide choice of power, signalling and telecommunications cables and components, specifically adapted to evolving rail infrastructures. In public areas and tunnels, virtually all of these cables are halogen-free, as well as flame-retardant, and thus assure low toxicity and minimal smoke to enhance survival, firefighting and emergency operations. For advanced telecommunications and train control, Nexans covers Wide Area Networks (main line); Metropolitan Area Networks for subways, light rail and intercity arrivals/departures; and station range outdoor cables for efficient rail management. Nexans provides trunk line and radio system optical fiber for multileveled analogue and digital railway applications (ERTMS/ETCS). Nexans also advises operators about evolving specifications and standards, and provides customized engineering, turnkey installation and maintenance anywhere in the world. We are engaged in ongoing R&D to keep all products competitive, compatible with modern standards and environmentally-friendly.

Nexans for safety, performance and comfort:

- All power, signalling and telecommunications cables and components for all infrastructure needs
- Advanced characteristics, EM immunity and high fire-performance
- European-based expertise for high-speed trains worldwide
- End-to-end turnkey systems for mainline and mass transit
- Complete train control cabling, from standard solutions to ERTMS/ETCS
- Custom engineering for country-specific challenges
- Innovative installation for trackside, tunnels and stations
- Open standards, interoperability and international delivery logistics
- Presence along the entire value chain, from R&D and design to maintenance and training



High-performance trains need efficient infrastructure

Rail transportation is very dependent on the quality of the infrastructure that supports it, and that includes cables and cabling systems for telecommunications and energy. Modern high-speed trains demand cables with different characteristics in terms of bandwidth, safety, electromagnetic immunity and resistance. A definite trend is interoperability, which allows trains to move easily across borders and even continents. Here, too, cables must comply with the new consolidated ERTMS/ETCS standards which are progressively integrating GSM-R radio technologies for train control, while continuing to rely on older route control systems (relay interlocking) for safety and redundancy.

Indeed, safety has become a prime concern for the world's rail operators, and there is a demand not only for more reliable operating systems, but also for materials with improved fire-performance characteristics, especially in tunnels, stations and public areas. Urban mass transit, subways, fully-automated metros, light rail suburban lines and trams are experiencing substantial growth, especially in Asia. Each rail mode has its own cable needs.

What railway operators expect of a cable manufacturer:

- Range of high-quality cables from one supplier
- Mastery of energy, data and radio-based technologies
- Installation for mainline, mass transit, tunnels, right-of-ways, etc.
- Enhanced fire performance for public and infrastructure safety
- Interoperability, open standards, and worldwide compliance
- Cable efficiency, compactness, lightness, and resistance
- Low costs, minimum maintenance, easy upgrades



POWER CABLES AND COMPONENTS

HV and MV feeder cables

HV and MV feeder cables carry power to and from substations along railways and metro lines. Special solutions include EPR or Silicone insulations for flexibility, and special XLPE insulations to withstand water, oil, heat, stress and extreme



temperatures, while meeting Low Fire Hazard requirements thanks to newest sheathing compounds. New designs offer non-hygroscopic characteristics, direct burial for underground-to-surface transitions

Nexans is upgrading MV cables for the London Underground to power new vehicles. We power subway systems in Paris, Berlin and Hamburg, and the MAGLEV Transrapid in Shanghai. Recent successes include Athens, Mexico City, Sao Paulo, Santiago, and Istanbul (200 km of 35 KV LFH cables).

MV and LV power cables and accessories

For 50Hz transport and distribution, the regular range of HV, MV and LV cables and components can apply.



Nexans produces MV accessories, like joints and terminations, plug-in connectors and bushings, as well as LV cabinets for aerial and underground applications.

Nexans has delivered MV and LV connectivity for subways, suburban express lines, and tramways in France and Germany, and supplied cable joints for Shanghai's state-of-the-art Transrapid.

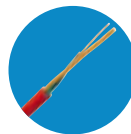
Grounding / earthing cables

Nexans manufactures low-voltage cables for grounding purposes in many sizes, insulation types and fire-behavior specifications.

To protect persons and material against lightning strikes on Paris' suburban express rail system, the RER, uses Nexans large cross-section LV cables.

Safety cables

These cables are generally halogen-free, low smoke and fire-retardant for subways. They are mainly used for station equipment (lighting, escalator, automatic doors) and tunnels (ventilation).



Cables for emergency equipment are also fire-resistant for circuit integrity, to keep essential services operating during a fire.

Nexans supplies armored safety cables under a longstanding contract with France's RATP, operator of the Paris Metro, as well as the London Underground.

Fire retardant or fire resistant MV power and feeder cables

In Metro projects, more and more MV feeder cables are now requested with improved Fire retardancy or even with some guarantees of service continuity during fire, but with application of the operation voltage.

Nexans has supplied fire resisting MV cables for the subways of Amsterdam and Budapest. Various technologies of insulation can apply, depending upon electrical and environmental requirements.

SIGNALLING CABLES

Multi-core cables

Typically K22 (RATP), A-2Y2YV, A-2Y2YB2Y, A-2Y2YDB2Y.



Copper, multi-core signaling and control cables are hybrid energy/telecom cables

providing LV energy and two-way telecom for wayside equipment, vital relays and systems for advanced train control.

Nexans is involved in the London Underground's Jubilee Northern Upgrade Program which will overhaul, upgrade and refit signalling on key lines. Other subway projects include the Daegu Subway line and Incheon International Airport in Korea, Santiago, Sao Paulo, New Delhi and Hanoi, Reims, and Algiers. In the US, Nexans is a prime supplier to AnsaldoSTS (Pittsburg). In Australia, Nexans has extended its supply contract with Railcorp.

Multi-quad cables

Typically K23 (RATP), ZPAU & ZPFU (SNCF), A-2Y(L)2YV or AJ-2Y(L)2YDB2Y.



Copper multi-pair signalling cables are twisted pairs or quad cables providing low

frequency and two-way telecommunications for field equipments.

For major railway operators, Nexans has developed customized EM-immunity (high-reduction factor) cables which are especially important for high-speed lines. Recent successes include several subway projects, like Santiago (Chile), New Delhi and Hanoi; and subway projects in Reims (France) and Algiers.

Axle counter cables

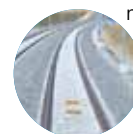
These cables connect trackside counting points which determine train presence, direction of travel, length, number of wagons and integrity.



Nexans continues to supply axle counter cables for the London Underground's Thales-based train control system.

Balise cables

Nexans advanced balise cables are flexible, resistant and have Electromagnetic Compatibility (EMC) for HF communications to eventually integrate a fully radio-based GSM-R traffic



management system. *Recent projects include the Marmaray project (an undersea earthquake-proof tunnel under the Bosphorus, Istanbul), and the New Delhi metro.*

Duo track cables

Figure-8 duplex copper/fiber cable, which is securely clamped right on the tracks



It is used to provide routing information with communications and control functions for regional railway lines, including ETCS capability. DuoTrack[®] achieves overall ownership cost savings of over 50%.

In 2009, Nexans received a three-year framework contract from Deutsche Bahn for a DuoTrack[®] system of about 1,000 km. Nexans not only worked closely with DB, but also with system integrators to achieve a truly unified turnkey solution.



**POWER CABLES
AND COMPONENTS**



SIGNALLING CABLES

...contributes to your railway network security



COMMUNICATIONS CABLES AND COMPONENTS

COMMUNICATIONS CABLES AND COMPONENTS

Optical fiber cables

To serve complex signalling and telecommunications for train control, Nexans has developed MANs and LANs optical fiber cables, and is also an expert in GSM-R technology.



To meet the security concerns of tunnels and urban metro systems, we produce metal-armored and all-dielectric OF cables. Increasingly, cost-efficient, compact micro cables are being used in dense subway networks.

Lisbon's intermodal Gare do Oriente uses Nexans optical-fiber-based LANs to coordinate rail, subway and surface transit, while an all-dielectric cable is used in the London Underground. Recent successes include the ongoing RATP contract (Paris), light rail for the Algiers suburbs, the Caracas subway, and tramways worldwide.

Optical fibre components

Nexans' splicing modules and jointing sleeves optimize fiber routing, thus guaranteeing network integrity.



They are easily implemented as an end-to-end solution in distribution frames, splicing closures and access points. Our modular Optical Distribution Frames provide a complete architecture for main exchange nodes or point-of-presence applications. Splice protection closures are used along the line or at access points to the local loop. *Nexans has provided special jointing sleeves for many urban rail projects in Europe. Robust closures can handle*

repeated re-entries and accept a fiber-copper mix. On top of this Nexans can adapt several types of splicing and distribution modules to cover all possible OF installations, including wall mounts or underground chambers while offering water-tightness and superior fire performance.

Copper long distance communications cables

From multi-pair telephone, radioflex and data cables to sophisticated hybrid copper/fiber for train



control, control-to-control, voice transmissions for internal telephony or loudspeaker information, video transmission, ticketing machines networking, etc. *For the London Underground, Nexans has outfitted emergency signal post telephones along the line to provide communications backup for subway drivers.*


Radiating cables

These perforated coaxial cables act like antennas in confined environments, like



tunnels or subway stations, where conventional antennas cannot operate. They are extremely important for radio-based technologies.

Nexans provided integral cabling for the 35 kilometer Lötschberg railway tunnel in Switzerland, the longest land tunnel in the world. Along with energy and optical fiber links, radiating cables assure full GSM-R operability. Nexans has also supplied radiating cables to the London Underground for many years.



NEXANS... service and support all along the line

Global expertise

The fact that we master all cabling technologies means that we are able to efficiently upgrade old infrastructures and install new ones. Since railways and urban transit systems are faced with enormous cost pressures, Nexans has developed innovative turnkey products, which include system engineering, project management and maintenance.

Local presence

With our European experience and knowledge of international standards, we can act anywhere on the globe, even on major transnational products, often providing our customers with local manufacturing capability and fast delivery. Key products have been fully qualified for southeast Asia (including China's CCC).

Technical leadership

Familiar with traditional and new train technologies, like high-speed lines, radio-based train control, and maglev power systems, Nexans has continued to innovate on all levels.

It takes an application-engineering approach to find customized solutions for tunnels, urban and mainline networks, and stations, always with fire safety in mind.



Global expert in cables and cabling systems

As a worldwide leading expert in the cable industry, Nexans, an energy focused company, provides best-in-class cable solutions to customers operating in five key sectors: energy infrastructures, energy resources, transportation, communication and building. Committed to customer satisfaction, the Group keeps focusing on innovation and investing for industrial and operational excellence. Environmentally aware, Nexans is dedicated to sustainable development in production, energy efficiency, waste reduction and recycling. With an industrial presence in 40 countries and commercial activities worldwide, Nexans employs 23,700 people and had sales in 2010 of more than 6 billion euros. Nexans is listed on NYSE Euronext Paris, compartment A.

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