

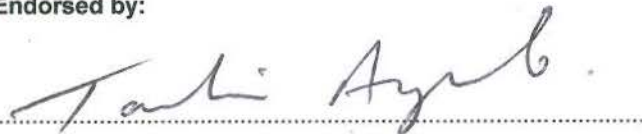
Ref:	NR/L2/SIGELP/27408
Issue:	2
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Level 2

Product Specification for Signalling Power Distribution Cables

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This Network Rail standard contains colour-coding according to the following Red–Amber–Green classification.

Red requirements – *No deviations, could stop the railway*

- **Red requirements shall** always be complied with and achieved.
- Red requirements shall be presented in a red box **with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of red requirements lies with the Professional Head/Standard Owner.
- Red requirements are monitored for compliance.
- Corrective actions shall be enforced if deviations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Amber requirements – *Controlled deviations, approved risk analysis and mitigation*

- **Amber requirements shall** be complied with unless deviation has been approved in advance.
- Amber requirements shall be presented with an amber sidebar **and with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of these requirements lies with the Professional Head/Standard Owner, or their nominated Delegated Authority.
- Amber requirements are monitored for compliance.
- Deviations **may** be permitted. Deviations are approved by the Standard Owner or through existing Delegated Authority arrangements.
- Corrective actions shall be enforced if **non-approved** deviations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Green – *Guidance*

- Guidance is based on good practice. Guidance represents supporting information to help achieve **Red** and **Amber** requirements.
- Guidance shall be presented with a dotted green sidebar **and with the word “should” (usually in notes) or as a direct instruction**.
- Guidance is **not mandatory** and is not monitored for compliance.
- Alternative solutions may be used. Alternative solutions do not need to be formally approved.
- Decisions made by a competent person to use alternative solutions should be backed up by appropriate evidence or documentation.

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Issue record

Issue	Date	Comments
1	December 2011	First issue
2	June 2015	Second issue includes a new enhanced unarmoured aluminium cable and the addition of water blocking.

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 31st December 2015.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 3 (Option Selection) to continue to comply with the issue of any relevant Network Rail standards current when GRIP Stage 3 was completed and not to comply with requirements contained herein, unless stipulated otherwise in the scope of this standard.

Reference documentation

BS 5467	Electric cables – Thermosetting insulated, armoured cables for voltages of 600/1000 V and 1900/3300 V
BS 6346	Electric cables. PVC insulated, armoured cables for voltages of 600/1000 V and 1900/3300 V
BS 6724	Electric cables – Thermosetting insulated, armoured cables for voltages of 600/1000 V and 1900/3300 V, having low emission of smoke and corrosive gases when affected by fire
BS 7655-1.3	Specification for insulating and sheathing materials for cables – Part 1: Elastomeric insulating compounds – Section 1.3: XLPE
BS 7671	Requirements for electrical installations
BS 7889	Electric cables – Thermosetting insulated, non-armoured cables with a voltage of 600/1000 V, for fixed installations
BS 8512	Electric cables – Code of practice for the storage, handling, installation and disposal of cables on wooden drums
BS 8573	Electric cables – Thermosetting insulated, non-armoured cables with a voltage of 600/1000 V, for fixed installations, and having low emission of smoke and corrosive gases when affected by fire

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BS EN 50363-5	Insulating, sheathing and covering materials for low voltage energy cables – Halogen-free, cross-linked insulating compounds
BS EN 60228	Conductors of insulated cables
IEC 60502-2	Power cables with extruded insulation and their accessories for rated voltages from 1 kV ($U_m = 1.2$ kV) up to 30 kV ($U_m = 36$ kV). Part 2: Cables for rated voltages from 6 kV ($U_m = 7.2$ kV) up to 30 kV ($U_m = 36$ kV)
NR/L2/RSE/100/05	Product introduction and change (formerly NR/L2/EBM/029)
NR/SP/ELP/27243	Specification for Signalling Power Supplies

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1 Purpose

This specification defines cable construction and performance requirements for signalling power distribution cables to be used in railway signalling systems.

2 Scope

Cables specified in this standard are intended for use in signalling power distributions systems where the nominal voltage is up to 650 V a.c. and where the electrical systems are either TN or IT.

This specification details the construction and test requirements for armoured and enhanced unarmoured copper and aluminium multicore core cables intended to be used in signalling power distribution systems covering a range of nominal conductor cross-sectional areas. The specification details the requirements for stranded copper and stranded or solid aluminium conductors.

The specification details the requirements for armoured cable having a PVC sheath and unarmoured cable with enhanced sheath and insulation thickness. Both cable types are specified with options for a sheath with low emission of smoke and corrosive gases when affected by fire. This specification also details security, water blocking and rodent protection requirements.

3 Definitions

For the purpose of this standard, the following terms and definitions apply.

Armoured cable	A cable having a covering consisting of metal wires, generally used to protect the cable from external mechanical effects.
Enhanced unarmoured cable	A cable having increased insulation and sheath thickness intended to provide a degree of protection against crushing and impact damage.
IT system	An electrical distribution system having no direct connection between live parts and earth.
LSOH	Low smoke zero halogen
NMR	Non-metallic rodent protection
PVC	Polyvinyl chloride
U_0	The rated power frequency voltage between conductors and earth or metallic screen for which the cable is designed.
TN system	An electrical distribution system having a direct connection between live parts and earth.
U	The rated power frequency voltage between conductors for which the cable is designed.