WREXHAM MINERAL CABLES

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Guide to the installation of Wrexham mineral insulated cables

The installation procedures, materials and components of the installation shall comply with the relevant standards approvals and specification.

EXAMPLES:

a) The current edition to the IEE regulations for electrical installations (BS 7671)

b) The appropriate British Standard specifications and codes of practice.

c) The Electricity Supply authority regulations.

d) The relevant National or International standards and codes of practice.

The Cable

Copper sheathed, Copper conductor cables, insulated with compressed mineral insulant, manufactured and tested in accordance with BS EN 60702-1:2002. LPCB approved and manufactured under a registered BS EN ISO 9001:2000 Assessed Quality Management System, by Wrexham Mineral Cables.
BASEC PRODUCT APPROVED

Light Duty Grade Cables

Rated up to 500 volts suitable for use where the voltage between the conductor/sheath and between conductors does not exceed 500 volts r.m.s a.c or 500 volts d.c.

Heavy Duty Grade Cables

Rated up to 750 volts suitable for use where the voltage between the conductor/sheath and between the conductors does not exceed 750 volts r.m.s a.c or 750 volts d.c.

Outer Coverings

Wrexham Mineral Cables can be supplied with an overall Low Smoke Zero Halogen (LSZH) thermoplastic serving. This serving may be required for one of the following reasons:

a) To provide protection of the copper sheath in potentially corrosive environments.

b) To provide circuit identification by colour.

c) For Aesthetic reasons.

Served cables are Halogen Free and have extremely low flame propagation.

When served cables are used in corrosive environments it is essential to replace any covering removed to facilitate termination, by taping over the exposed copper sheath and backnut of the ring type gland, under the gland shroud.

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Terminating

A termination is required at each end of a length of cable and it should be fitted as soon as the cable end has been prepared, i.e., cut to length and the sheath removed. All termination's supplied by Wrexham Mineral Cables comply with the requirements of BS EN 60702-2:2002 and should be fitted in accordance with the manufacturers latest recommended terminating procedure (see WMC 009).

Seals

The standard seal ref: RPS or RPSL has a recommended continuous operating temperature range of -80°C to 105°C for all general use.
The RPSL seal has an integral earth tail crimped and soldered into the brass seal pot and are offered as an alternative to the plain seal for conductor sizes up to and including 50mm².
Where cables are not secured into enclosures by means of cable glands, RPSL (Earth Tail Seals) must be utilized to ensure the integrity of the circuit protective conductor.

Also, Increased Safety Seals ref: RPA standard or RPAL with an earth tail, are available for applications using increased safety equipment (type of protection 'e') in potentially explosive atmospheres (see WMC 017).
These are fully certified to BS EN 50014:1997 (amendments A1 – A2) & BS EN 50019:2000 and compliance with ATEX Directive 94/9/EC.

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Glands

Wrexham Mineral Cables brass externally threaded compression Ring Type Glands ref: RGM with 20mm, 25mm, 32mm & 40mm threads are manufactured in accordance with BS EN 60702-2, certified and approved for use in potentially explosive atmospheres, II2 EExd II, fully compliant with ATEX Directive 94/9/EC. Stamped with the certificate of conformity number Sira 02ATEX1305X. These ring type glands are specifically approved for flameproof apparatus (type of protection ‘d’) Zones 1 & 2, Groups IIA, IIB and IIC.

Jointing

Wrexham Mineral Cable ring type glands are provided with standard ISO metric conduit threads, so they can be used with standard entry switch, socket and conduit boxes.

This feature facilitates the ready jointing of cable by means of through-type boxes of suitable size and shape. If it is necessary for the joint to be watertight the box should be filled with a suitable plastic sealing compound.

For those applications where there is limited space, or neatness is an important consideration the alternative is an internally screwed brass sleeve Ref: RJMZ available in 20mm, 25mm, 32mm and 40mm sizes. Terminated in the usual manner, using screw-on seals with ring type compression glands. The conductors are joined by crimp connector or soldered ferrule. Following the manufacturers latest recommended jointing procedure (see WMC 011).

Straightening the Cable

Before fixing, the cable can be straightened by hand or with a roller straightener Ref: ZBS (For cables up to 12mm diameter). A rubber mallet or a hammer and block of wood being used for final dressing. A metal hammer alone should never be used as it may result in unsightly dents that cannot be removed.

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Bending the Cables

Bends shall normally be restricted to a minimum radius of six times the bare cable diameter. When sharper bends are required, they may be made to a minimum of three times the cable diameter, but re-straightening may not be carried out due to work hardening of the copper sheath.

Fixing the Cable

Wrexham Mineral Cables can be fixed to surfaces by means of clips ref: RC (bare) & RCHL (LSZH coated). Two way saddles ref: RS (Bare) & RSFL (LSZH coated) or fixing strip, pre-punched ref: RSH (Bare) & RSHL, solid ref: RSZ & RSZL (LSZH coated).

The recommended & maximum distance between fixings is dependant on the size of the cable.

Overall Diameter of Cable	Spacing of clips in mm					
	Horizontal			Vertical		
	Surface	Tray	Max	Surface	Tray	Max
Up to 9mm	350	500	600	375	500	800
9mm – 15mm	375	650	900	425	650	1200
15mm – 20mm	450	700	1500	500	700	2000
Above 20mm			2000			3000

Testing

The magnesium oxide insulation of Wrexham Mineral Cable has been specially formulated with a high-density compaction to oppose moisture ingress. If left unsealed during installation atmospheric moisture will only penetrate to a depth of 20 - 40mm. Subsequent stripping back of the copper sheath during termination will remove any effected insulation..

Insulation testing should never be carried out on cables which have unsealed ends because this will result in false and misleading readings. Moisture in the atmosphere can be recorded across the face of the exposed magnesium oxide insulation resulting in false low insulation resistance readings.

After both ends have been terminated with permanent seals, the cable should be tested for insulation resistance at a d.c. voltage appropriate to the intended operating voltage, as per regulations. This initial test is to check for major faults, (Short circuits within the seal pot) in which case the fault can be located and rectified.

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The insulation resistance reading should be noted and compared with the value measured twenty-four hours later. The insulation resistance should be at least 100meg ohms and have risen from the initial test.

Transient Overvoltage

A Transient Over voltage is a short duration increase in voltage measured between two or more conductors. Anything from micro seconds (millionths of a second) to a few milliseconds (thousandth of a second) in duration. The increase in voltage will vary from a few volts to thousands of volts, between two or more conductor's live/phase, neutral and earth.

'Transient Overvoltage' is both technically and descriptively the best term. However, transients are also variously referred to as surges, spikes and glitches. The term 'surge' though widely used, should be used with caution. In some parts of the world, Britain amongst them, surge is used by the electricity supply industry to refer to a sustained overvoltage of several cycles duration. Transient over voltages are by definition a very specific form of disturbance.

Electrical Switching

Transient overvoltages caused by electrical switching are common and can be a source of considerable interference. Current flowing through a conductor creates a magnetic field in which energy is stored. When the current is interrupted or switched off the energy in the magnetic field is suddenly released. In an attempt to dissipate itself it becomes a high voltage transient.

The more energy stored, the larger the resulting transient. Higher currents and longer lengths of conductor both contribute to more energy stored and also released. It is common knowledge that inductive circuits such as motors, transformers, electrical drives, contactor coils and miniature fluorescent fittings can produce transient voltages exceeding the line voltage. When the current flowing in them is suddenly interrupted, and under adverse conditions these transient voltages can cause a breakdown in the various components.

This phenomenon is recognised in the IEE Wiring Regulations (BS 7671) and it is the Designers/Installers responsibility to ensure compatibility between circuit components.

Suppressors available:

Order Ref: RRN 1

A heavy duty single phase suppressor. Three can be used star connected for motors in the range of 1hp to 6hp. Suitable for use up to 250 volts a.c with the star point connected to neutral.

Order ref: RRN 2

Two wire suppressors for use up to 415 volts a.c. Intended for Use with contactor coils.

Order Ref: RRN 3

Three wire suppressor for use up to 415 volts a.c. For motors up to and including 1hp. (To be connected at the motor terminals).

Order Ref: RRN 4

Two wire suppressor 240 volt a.c. For use with discharge lighting.

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Installation Design Data

Cable selection

Cables should be selected in accordance with the requirements of the current edition of the IEE regulations for electrical installation. The type of cable used in a particular installation depends on the conditions of installation and the suitability of the cable.