

## CATHODIC PROTECTION CABLE CONDUCTORS

### 1.8.1

**BAC** carry large stocks of all the typical types and sizes of cathodic protection cables and can advise customers on the most suitable cable for their particular application.

Besides the cables referred to, **BAC** can supply many other types and sizes to order.

Such types could include single and multicore cables; copper or aluminium conductors; polyethylene, PVC or rubber insulation; brass tape sheaths and steel or aluminium armouring. All cables are normally supplied in 600/1000V grade.

#### Ancillaries

Also available is a range of cable splicing kits and cable marking tapes to suit all applications

#### ABBREVIATIONS AND GENERAL DESCRIPTIONS

**PVC (Polyvinyl Chloride)** is available in many compound forms but those used in cable manufacture are plasticised to allow extrusion techniques and subsequent flexibility.

**PE (Polyethylene)** is available in various forms, the most widely used description being "low and high" density, with additional designations to denote the melt-flow index (MFI).

#### **XLPE (Cross Linked Polyethylene)**

Cross-linked polyethylene is a compound form of PE, which enhances the mechanical stability.

**PVF (Polyethylene Fluoride e.g. Kynar)** is a high performance, mechanically strong fluorocarbon, having excellent chemical resistance and are thus ideal for deep ground beds and feeders to underwater anodes. PVF is specially recommended for a Chlorine environment.



**EPR (Ethylene Propylene Rubber)** is the most widely used synthetic rubber in the field of electric cable manufacture. It is thermally set by vulcanisation and is an excellent flexible dielectric.

**CSP (Chlorosulphonated Polythene) e.g. Hypalon** is also a vulcanised synthetic rubber and is used as a mechanical covering (sheathing or jacket) to cable insulated with EP rubber.

#### **HMWPE (High Molecular Weight Polyethylene)**

Using a particular polymerisation technique a high-density form of polyethylene is produced. Resistance against solvents and water can be classified as excellent.

#### **SWA (Steel Wire Armour)**

Steel wire stands between the layers of insulation for protection against mechanical damage.

#### Groups:

EPR and CSP are elastomeric thermosetting compounds whilst the remainder are the thermoplastic compounds.

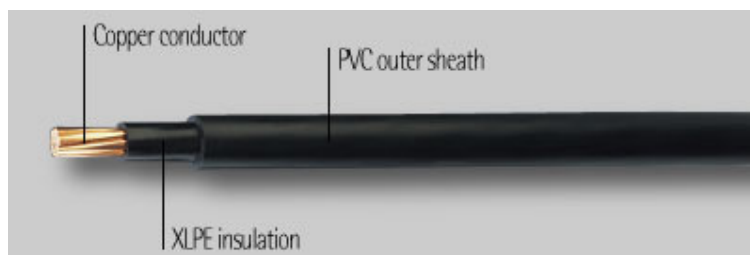
Different insulation compounds can be combined in any of the following ways:

PVC  
PVC/PVC  
PE/PVC  
EPR/CSP  
XLPE/PVC  
XLPE/PVC/SWA/PVC  
PVDF Single Shot  
PVDF/HMWPE

**SINGLE CORE CABLE – XLPE/PVC.....1.8.1 continued**

- **Insulation:** XLPE (Cross Linked Polyethylene) - Cross-linked polyethylene is a compound form of PE, which enhances the mechanical stability
- **Sheath:** PVC - is available in many compound forms but those used in cable manufacture are plasticized to allow extrusion techniques and subsequent flexibility. It has good ageing and mechanical properties. Can be supplied in Black or Red.
- **Conductor:** Stranded or Solid Plain Annealed Copper.
- **Application:** Designed for use in cathodic protection systems. These cables are provided with PVC sheath for protection and are therefore suitable for external use and direct burial.
- **Technical Data:** Voltage: 600/1000V,  
Temperature range: -20 °C to +70 °C
- **Relevant Standards:** Conductor: To BS6360 up to 35 mm<sup>2</sup>  
To BS6346 above 50 mm<sup>2</sup>

Meets IEC 502

**Sizes and Dimensions**

All sizes and dimensions are approximate and for information only. BAC will confirm actual dimensions at time of order if required:

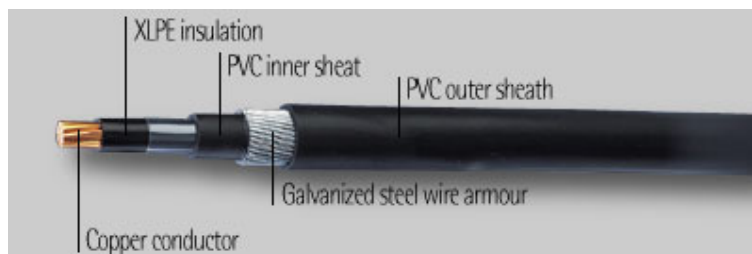
Conductor Size (mm <sup>2</sup> )	Number of Strands	Nom. O.D. (mm)	Approx. Nett Weight (kg/km)
6	7	6.7	99
10	7	8.0	155
16	7	9.1	225
25	7	11.2	340
35	19	12.4	445
50	19	14.7	595
70	19	16.5	810
95	19	19.0	1110
120	37	20.6	1340

## SINGLE CORE CABLE – XLPE/PVC/SWA/PVC

### .....1.8.1 continued

- **Insulation:** XLPE (Cross Linked Polyethylene) - Cross-linked polyethylene is a compound form of PE, which enhances the mechanical stability
- **Bedding:** Extruded PVC - is available in many compound forms but those used in cable manufacture are plasticized to allow extrusion techniques and subsequent flexibility. It has good ageing and mechanical properties.
- **Armour:** Galvanised Steel Wire Armour - Steel wire stands between the layers of insulation for protection against mechanical damage.
- **Sheath:** PVC Black - is available in many compound forms but those used in cable manufacture are plasticized to allow extrusion techniques and subsequent flexibility. It has good ageing and mechanical properties.
- **Conductor:** Stranded or Solid Plain Annealed Copper.
- **Application:** Designed for use in cathodic protection systems. These cables are provided with mechanical protection are therefore suitable for external use and direct burial.
- **Technical Data:** Voltage: 600/1000V,  
Temperature range: -40 °C to +90 °C
- **Relevant Standards:** Conductor: To BS6360,  
Sheath: To BS6746 Type G

Meets IEC 502



### Sizes and Dimensions

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Conductor Size (mm <sup>2</sup> )	Number of Strands	Diameter of Conductor (mm)	Nom. O.D. (mm)	Approx. Nett Weight (kg/km)	Gland Size
16	7	5.1	13.5	435	20S
25	7	6.4	15.3	575	20
35	7	7.7	17.4	805	20
50	7	8.9	19.1	1010	20
70	19	10.7	21.1	1210	25
95	19	12.6	23.4	1620	25
120	19	14.2	26.3	2100	25

## SINGLE CORE CABLE – PVDF/HMWPE....1.8.1 continued

- **Insulation:** Polyvinylidene fluoride (PVDF) is a tough, engineering thermoplastic that offers a unique balance of properties. It has the characteristic stability of fluoropolymers when exposed to harsh thermal, chemical, and ultraviolet environments, while the alternating CH<sub>2</sub> and CF<sub>2</sub> groups along the polymer chain provide a unique polarity that influences its solubility and electric properties.

Key Attributes of PVDF include:

- Mechanical strength and toughness
  - High abrasion resistance
  - High thermal stability
  - Resistant to most chemicals and solvents
  - Resistant to ultraviolet radiation
  - Resistant to weathering
  - Low permeability to most gases and liquids
  - Low flame and smoke characteristics
- **Sheath:** High-Molecular Weight Polyethylene (HMWPE), which provides outstanding dielectric strength and moisture resistance. During the installation the cable can withstand considerable mechanical abuse without risk of damage to the copper electrical conductor. The polyethylene cover is also chemically resistant and protects against most organic and inorganic substances.
  - **Conductor:** Stranded or Solid Plain Annealed Copper.
  - **Application:** Designed for use in cathodic protection groundbeds where the evolution of chlorine gas is expected. PVDF has excellent resistance to chemical attack and is recommended for all BAC MMO anode strings especially those for deep well groundbeds.
  - **Technical Data:** Voltage: 600/1000V,  
Temperature range: -20 °C to +90 °C



### Sizes and Dimensions

All sizes and dimensions are approximate and for information only. BAC will confirm actual dimensions at time of order if required:

Conductor Size (mm <sup>2</sup> )	Number of Strands	Nom. O.D. (mm)	Approx. Nett Weight (kg/km)
6	7	7.5	89
10	7	8.4	144
16	7	9.4	196
25	19	11.1	312
35	19	12.3	409