



## Technical Specification 12-23

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Polyethylene Warning Tape, Polyethylene  
Protection Tape and Polyethylene Protection Tiles  
for Buried Electricity Supply Cable

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## **POLYETHYLENE WARNING TAPE, POLYETHYLENE PROTECTION TAPE AND POLYETHYLENE PROTECTION TILES FOR BURIED ELECTRICITY SUPPLY CABLE**

### **Foreword**

This specification has been produced on the basis of experience gained in trial installations.

Three different products are specified: Polyethylene warning tape, polyethylene protection tape and polyethylene protection tile.

The protection tape and protection tile consist of a base of reconstituted polyethylene to which is laminated a polyethylene warning tape.

### **1. Scope**

This Specification details the materials, dimensions, physical and chemical properties, colour, lettering layout and testing of polyethylene warning tape, polyethylene protection tape and polyethylene protection tile for laying above buried electricity supply cables.

### **2. References**

This specification makes reference to the following documents:

BS 5252: 1976 (confirmed 1996)	Framework for Colour Co-ordination for Building Purposes
ISO 4593 1993	Plastics – Film and sheeting Determination of thickness by mechanical scanning
BS EN ISO 527: 1996	Plastics – Determination of tensile properties. Part 1: General principles. Part 2: Test conditions for moulding and extrusion plastics. Part 3: Test conditions for films and sheets.
BS EN ISO 1183: 2004	Methods for determining the density of non-cellular plastics.
BS EN ISO 1133: 2005	Plastics: Determination of the melt flow rate (MFR) and the melt volume rate (MVR) of thermoplastics.

### **3. Definitions**

The following definitions apply:

**3.1. Tensile stress:** tensile force per unit of the cross-sectional area of the un-stretched test piece.

**3.2. Tensile strength:** maximum tensile stress recorded in extending the test piece breaking point.

**3.3. Elongation at break:** increase of the reference length of the test piece, expressed as a percentage of the reference length of the un-stretched test piece, at breaking point.

#### 4. Conformance and changes to materials

A test certificate shall be supplied by the supplier to the purchaser, on request. If changes are made to the materials used and / or the process of manufacture, the relevant conformity assessment tests as agreed between the purchaser and the supplier shall be repeated.

#### 5. Materials and construction

The warning tape shall consist of a printed polyethylene tape. The material shall be manufactured from a **low density polyethylene (LDPE)** blend, which enables the warning tape to conform to the requirements of the standard. The use of re-worked or re-processed material is not permitted. The material and colourants shall have no detrimental effects on the environment.

The protection tape and protection tile shall consist of a base material to which is laminated a warning tape. The base material shall be manufactured from re-constituted low density polyethylene (LDPE) to which has been added only those materials needed to facilitate the required good finish, strength, durability, colours and opacity. The warning tape shall be manufactured in accordance with this specification and then laminated to the upper surface of the base material.

The protection tiles shall be joined using a hole and peg system. The hole size shall be 5/8" (15.5mm) and drilled at both ends of each tile. The hole centres shall be positioned in the centre of the tile width (+/- 2mm) and 25mm in from the tile end (+/-2mm).

#### 6. Dimensions

##### 6.1. Length

Warning tape	Protection tape	Protection tile
365m (+/- 10m)	40m (+/- 1m)	1m (+/- 10mm)

##### 6.2. Width

Warning tape	Protection tape	Protection tile
150mm (+/- 2mm)	200m (+/- 2mm)	300mm (+/- 2mm)

### 6.3. Thickness

Warning tape	Protection tape	Protection tile
0.1mm average*	2.5mm (+/- 0.3mm)	To meet the specified CLASS 1 or CLASS 2 acceptance criteria (see Appendix A)

\*Please note: The average thickness of the warning tape shall be 0.1mm (+/- 0.015mm), when measured in accordance with 11.1.

## 7. Physical Properties

The warning tape, the protection tape and the protection tile shall have the following physical properties indicated.

### 7.1. Tensile Stress and Elongation

Minimum ultimate tensile strength at break.

Warning tape	Protection tape	Protection tile
15 MN/m <sup>2</sup>	10 MN/m <sup>2</sup>	8.4 MN/m <sup>2</sup>

Elongation at break.

Warning tape	Protection tape
>400%	>300%

### 7.2. Impact resistance

The protection tile shall pass the impact test described in **Appendix A**.

### 7.3. Density

The density of the polyethylene polymer of the warning tape shall lie between 910 and 935 kg/m<sup>3</sup> at 20°C.

The density of the re-constituted polyethylene used to produce the protection tape and the protection tile shall lie between 910 and 990 kg/m<sup>3</sup> at 20°C