



**EEHC DISTRIBUTION MATERIALS SPECIFICATION**

**EDMS 30 - 310 - 1**

**Date: 2-8- 2022**

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**TECHNICAL SPECIFICATION FOR  
POLYETHELENE UNDER GROUND WARNING TAPE**

Issue: June-2022/ Rev-1



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### 1. SCOPE

This specification covers the minimum technical requirements for design, manufacturing, testing, and supply of Polyethylene under ground warning tape identify and give early clear Visual warning to excavators that electrical power cable is buried underneath.

### 2. APPLICABLE STANDARDS

The material covered in this specification shall comply with the latest edition/amendment of the standards given in Table (1). Where any provision of this specification differs from those of the standards listed below, the provisions of this specification shall apply. Any deviations from the listed standards or the provisions of this specification shall be clearly set out in the offer.

**Table no. 1**

<u>S.No.</u>	<u>Standard No.</u>	<u>Description</u>
1.	BS 5252	Framework for Color Co-ordination for Building Purposes
2.	ISO 4593	Plastics – Film and sheeting Determination of thickness by mechanical scanning
3.	BS EN ISO 527	Plastics – Determination of tensile properties. Part 1: General principles. Part 2: Test conditions for molding and extrusion plastics. Part 3: Test conditions for films and sheets.
4.	BS EN ISO 1183	Methods for determining the density of non-cellular plastics.
5.	BS EN ISO 1133	Plastics: Determination of the melt flow rate (MFR) and the melt volume rate (MVR) of thermoplastics.
6.	ASTM D792	Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
7.	ASTM D882	Test Method for Tensile Properties of Thin Plastic Films
8.	ASTM D2103	Specification for Polyethylene Film and Sheeting
9.	ASTM D2578	Test Method for Wetting Tension of Polyethylene and Polypropylene Films



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### 3. ENVIRONMENTAL CONDITIONS

The performance of the required warning tape should be guaranteed for following the environmental conditions, any differences in the guaranteed performance should be clearly set out in the offer.

Ambient temperature	-5°C to +50°C
Maximum relative humidity	10% to 100%
Environment	Soil conditions vary from dry sandy to wet silt or clay In some areas the soil is alkaline in others it is acidic or salty .

### 4. CONSTRUCTION REQUIREMENTS :

#### 4.1 Design :

- The warning tape shall consist of a printed coloured, non-adhesive film 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.
- It printed with a message to warn of the presence of buried utilities (electric cables).
- Underground warning tape is normally installed a specified distance directly above the service line so that any future excavators will be aware of the cable or pipeline further below.
- The use of re-worked or re-processed material is not permitted.
- Warning tapes will only offer a visual warning to excavators. They are not intended to offer any protection or resistance to further excavation.
- The material and colourants shall have no detrimental effects on the environment , A color coded background is treated so as not to degrade or fade when exposed to alkalis, acids and or any other destructive elements under ground.
- The warning tapes should be resistant to most soil types including alkaline and acidic soils



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- The imprints in the warning tapes shall be indelible, lead-free, black color and shall be overcoated to protect the imprints from acids, alkalis, and other soil substances.

### 4.2 Definitions:

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

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

**٤.٢.3 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.

### 4.3 Dimensions:

Type	Identoline – non detectable	Identoline - detectable
Material	Polyester	Aluminum foil core sandwiched between two layers of polyester.
Thickness	0.09 mm (0.0035 inch) thick to ASTM D1593.	0.13 mm (0.005 inch) thick to ASTM D1593.
Tensile strength	123 N/100 mm (7 lb/in) to ASTM D638.	740 N/100 mm (25 lb/in) to ASTM D638.
Elongation	300%, to ASTM D638.	50%, to ASTM D638.
Text colour	Black.	Black.
Background colour	Red.	Red.
Rolls	152 mm x 305 m (6" x 1000 ft).	52 mm x 305 m (2" x 1000 ft).



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### 4.4 Physical properties :

- Thickness Foil core  $\geq 0.04$ .
- Elongation 80% MD , 150 % TD ASTM D -882.
- Tensile 7800 to 15000 PSI ASTM D – 882.
- Density 1.09 g/ cm<sup>3</sup> ASTM D-792-66.
- Printability  $\geq 45$  Dynes ASTM D-2578-08.
- Flexibility : pliable Hand ASTM D 671-76.
- Slite Width : Standard Widths : 2,3,4,6 and 12 inches.
- Length : standard Roll Length : 1000 Feet .

### 4.5 Applications :

- Non-detectable tape: Bury tape 300 to 450 mm (12 to 18 inches) below ground level, directly over the utility it identifies.
- Detectable tape: Bury tape 100 to 150 mm (4 to 6 inches) below ground level, directly over the utility it identifies. Follow tape manufacturer's instructions.

### 4.6 Product and usage :

- Sharply printed legend on APWA color coded background.
- Cost-Effective: Detectability feature minimizes line locating time and needless digging expenses. Utility/contractor liability is reduced, and expensive line damage is averted.
- Long Lasting: Tough material features subsurface graphics to seal the legend from acids, alkalis and other soil substances.
- Easily Installed: May be manually or automatically installed.



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### 5. TESTING AND INSPECTION:

#### 5.1 General :

- ✓ Warning tapes shall be subjected to the following tests in accordance with the latest relevant standard and as specified herein.
- ✓ All tests shall be carried out by and at the expense of the tenderer who shall supply all the apparatus, instruments and equipment.
- ✓ Tests shall be carried out by an accredited independent testing laboratory (or other testing laboratories accepted by \_\_ EDC).
- ✓ Tests shall be carried out in the presence and under the control of the inspecting engineer of \_\_ EDC, except in specified or approved cases where test certificates are accepted. All test results shall be reviewed and approved in writing by \_\_ EDC.
- ✓ The contractor should advise testing dates. The contractor shall not be entitled to any extension of the time of completion due to the failure of any test or the rejection of any part of the materials as a result of any test.
- ✓ Test reports shall clearly show the equipment concerned, the manufacturer's identity, the tests carried out, test results and the standard's requirements against the test results to determine passing or failing of the test.

#### 5.2 Tests :

- The following tests shall be carried out for the offered warning tape conforming to the latest edition of BS EN ISO 527 standard:
  - ✓ Material Identification
  - ✓ Test Procedure
  - ✓ Test Temperature
  - ✓ Elongation
  - ✓ Tensile Strength (Transverse)
  - ✓ Tensile Strength (Longitudinal)
  - ✓ Roll Weight



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### **6. SUBMITTALS**

#### **6.1. SUBMITTALS REQUIRED WITH TENDER/INQUIRY**

- 6.1.1 The supplier shall complete and return one copy of the attached Data Schedule.
- 6.1.2 Manufacturer's Catalogue.
- 6.1.3 Certificate stating that the raw material has been sampled, tested and inspected in accordance with relevant standard specifications & A valid approval certificate issued by Egyptian Electricity Holding Company.
- 6.1.4 Filled-up technical data schedule of the item offered .
- 6.1.5 Proof that the product offered is already been supplied and used in utility companies.
- 6.1.6 Copy of test reports
- 6.1.7 USB Flash Drive containing e-copy of all the documents mentioned above.
- 6.1.8 One sample of each offered warning tape should be submitted .

#### **6.2 SUBMITTALS REQUIRED FOLLOWING AWARD OF CONTRACT:**

- Details of manufacturing and testing schedules
- Packing details.
- The supplier should provide all the instructions of use/storing in (Arabic and English).

### **7. MARKING :**

1. Manufacturer's name.
2. Type of warning tape and possible modes of use (description of the type, length of the tape, width of tape, thickness of tape )
3. Standard (include document date) to which the tape conforms
4. Indication to the necessity for users to read the instructions for use.
5. Month and year of manufacture
6. Weight of the tape (in g) .
7. A warning quote " إحدركابل كهربائى فى الأسفل " shall be marked throughout its length.
8. The distances between marking shall not exceed one meter .





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### 8. PACKING

- Packing should be robust and able to withstand very rough handling during transportation. It should be protected against ingress of moisture.
- The details of method of packing should be submitted with the offer.
- The type of packaging suitable for transport shall be defined by the manufacturer
- At the request of the customer or according to government specifications any additional or amended instructions shall be included in the package



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### 9. SCHEDULE GUARANTEE

- The tenderer must fill in thoroughly the attached technical data schedule.
- Any offer does not accompanied with clear and complete technical data schedule shall be rejected.

No	Description	Specified Values (*)	Vendor Proposed Values (**)
<b>1</b>	<b>Warning Tape</b>		
	Material (Virgin Grade)	Low Density Polyethylene Film	
	Resistant to most soil types including alkaline and acidic soils	Yes	
	Thickness + Tolerance	200µm ± 50µm	
	Width	150mm	
	Roll Size	Not less than 300 m	
	Color	Traffic red (RAL 3020)	
<b>2</b>	<b>Imprints</b>		
2.1	Color	Black	
2.2	Material	Indelible Lead-Free	
2.3	Design	As specified	
2.4	Overlay Clear Coating	Yes	
	Manufacturer	**	
	Manufacturer Catalogue Number	**	
	Country of Origin	**	
	Submittals Required with Tender/Inquiry Included or Not?	**	



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Description	Manufacturer of Material/Equipment	Vendor/Supplier
Vendor/Supplier		
Location and Office Address		
Name and Signature of Authorized Representative with Date		
Official Seal / Stamp		

**10. DRAWINGS:**

