

**WATER SUPPLIES DEPARTMENT**  
**STANDARD SPECIFICATION E-30-02**  
**EARTHING AND LIGHTNING PROTECTION MATERIALS**

1. GENERAL

1.1 Standards

Earthing and lightning protection materials supplied shall comply with the latest issues and revisions of the following IEC and BS Standards:-

BS EN 13601	Copper and copper alloys. Copper rod, bar and wire for general electrical purposes
BS EN 12165	Copper and copper alloys. Wrought and unwrought forging stock
IEC 60811	Common test methods for insulating and sheathing materials of electric cables and optical cables
IEC 62305	Protection against lightning
IEC 60364-5-54	Selection and erection of electrical equipment – Earthing arrangements, protective conductors and protective bonding conductors

1.2 Test Certificates

Sample tests to BS EN 13601 shall be carried out on the earthing and lightning protection materials. The tests shall include both mechanical tests and electrical resistivity tests. Sample test certificates complete with detailed test results for similar materials used in the same equipment by the supplier within the last 18 months shall be submitted for assessment upon request.

2. COMPONENT CONSTRUCTION

The following earthing and lightning protection materials shall be supplied as specified in the Specification and Drawings:-

2.1 Earthing Plates and Tapes

Earthing plates and tapes shall be made of high conductivity copper to BS EN 13601 designation C101. The copper shall be in the annealed condition, complying with BS EN 13601 table 2 designation 0. The size of the copper earthing plate shall be 1200mm x 1200mm x 6mm unless otherwise specified.

## 2.2 PVC Sleeving

PVC sleeving shall be yellow/green in colour and manufactured from flame-retardant polyvinyl chloride with physical properties complying to IEC 60811.

The dielectric strength of the PVC sleeving shall be not less than 11.5kV/mm in standard wall thickness of 0.35mm.

## 2.3 Earthing Rods

Earthing rods shall be copperbond steel cored rods of 16mm diameter and standard length of 1200mm. The copperbond layer shall be 99.9% pure electrolyte copper of thickness not less than 0.25mm.

The bonding of the copperbond layer shall be rigid in such a way that when a hole is being driven through on a vice, there is no separation between the copperbond layer and the steel core in the resulting shearing.

Rods shall be extensible by means of external couplings, and shall be provided with driving studs to protect the rod end when driven by a hammer.

## 2.4 Air Terminals

Each air terminal shall comprise the following components:-

- (a) Copper taper pointed air rod and multiple point; and
- (b) Copper air terminal base or ridge saddle for supporting taper pointed air rod.

## 2.5 Tape Clips

Tape clips for fixing earthing tapes shall be of the direct contact type manufactured from copper or copper alloy to the requirements of BS EN 12165 designation CW719R.

## 2.6 Junction Tape Clamps

Junction tape clamps for joining, teeing or crossing of earthing tapes shall be manufactured from copper or copper alloy to the requirements of BS EN 12165 designation CW719R.

## 2.7 Test and Junction Clamps

Test and junction clamps for isolating the down conductor and earth electrode shall be of the oblong type manufactured from copper or copper alloy to the requirements of BS EN 12165 designation CW719R.

2.8 Earth Rod Clamps

Earth Rod Clamps for connection of earth rod and earthing tape shall be of heavy duty type manufactured from phosphor bronze.

2.9 Earth Terminal and Disconnecting Link

Earth terminal and disconnecting link for 50mm x 6mm copper tape shall be complete with channel base, insulator studs and nuts.

- End of this Specification -