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Procedures for Measuring the Conductivity of Poly-Ground[®]

Section 1. Overview

Conductivity is an important factor in considering the grounding capabilities of our Transmission and Distribution Network.

This method determines the conductivity of Poly-Ground, which is based on 129-E test procedures of Texas Department of Transportation, using DC two-electrodes method.

Units of Measurement

The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

Section 2. Definitions

The following term and definition is referenced in this test method:

- ◆ **Conductivity:** The ability of a material to allow electrons to flow, measured by the current per unit of voltage applied. Also, it is the reciprocal of resistivity.

Section 3. Apparatus

The following apparatus is required:

- ◆ True RMS meter for measuring Ohm's.
- ◆ 2 - copper plates 3.5" x 3.5"
- ◆ Wood clamps for attaching copper plates to the Poly-Ground test specimens

Section 4. Material

The following material is needed:

- ◆ Poly-Ground test specimens

Section 5. Procedure

The following table lists the steps required to measure the conductivity of Poly-Ground.

Measuring the Conductivity of Poly-Ground	
Step	Action
1	Cut Poly-Ground test specimens to 3.5" x 3.5" x 3.5" cubes.
2	Allow the samples to cool to room temperature before testing.
3	Clamp the Poly-Ground cube between the two copper plates with the wooden clamps.
4	Touch each plate with one of the probes from the RMS meter.
5	Read the ohm's value.
6	Remove the sample rotate 90° then place back into the clamps with the copper plates.
7	Read the ohm's value.
8	Remove the sample from the clamps.
9	Repeat 3-8 above steps with other two orientations.

Section 6. Calculations

Use the following calculations to determine soil box factor and conductivity.

- ◆ Calculate the Soil Box Factor (SBF):

$$SBF = A / D$$

Where:

- A = Area of one electrode, cm²
 - D = Distance between electrodes, cm.
- ◆ Calculate the resistivity in ohm-meter,

Resistivity (ohm-m) = 0.01 x SBF x Resistance using resistivity meter:

$$R = SBF(R_{OHM})$$

- Conductivity (Siemens/meter) = 1/ Resistivity (ohm-m)

Section 7. Reports

The report will show an average of the total readings in three different orientations.