

# SAE Inc. Standard No. 103

## Elastic & Maximum Compression Testing of the ConduDisc

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### ABSTRACT

This test method is used to evaluate whether the ConduDisc experiences elastic compression when subjected to various loading conditions, such as when attached to the bottom of a utility pole. Samples are compressed using an Instron Universal Testing Machine at various loading conditions and the amount of compression is measured. Materials that return to their original dimensions with no damage after the load is removed have elastic compression properties.

### 1. INTRODUCTION

- 1.1 This test method simulates the loading that a ConduDisc will experience when attached to the bottom of a utility pole in situ.
- 1.2 The heaviest wooden utility poles are 125 ft Class H-6 Douglas Fir Poles which weigh 15 480 lbs, or 7022 kg.
- 1.3 The heaviest spun concrete utility poles are 118 ft Class K poles which weigh 24 088 lbs, or 10 926 kg.
- 1.4 These pole weights do not include the weight of the wires, transformers, and any additional equipment attached to the pole after installation.

### 2. EQUIPMENT REQUIRED

- 2.1 Instron 150 LX Universal Testing Machine (UTM)
- 2.2 Six-inch diameter steel plates for the Instron
- 2.3 Vernier caliper

### 3. TEST SETUP

- 3.1 Install the steel plates into the Instron 150 LX UTM and ensure they are far enough apart to place a ConduDisc into the apparatus.
- 3.2 Place the full sized ConduDisc between the Instron's steel plates and manually close the gap between the plates until the top steel plate is just touching the top of the ConduDisc.

### 4. PROCEDURE

- 4.1 Record the thickness of the ConduDisc before the compression testing begins.
- 4.2 On the Instron software set a compression rate of no more than 500 kg/minute.
- 4.3 Start the compression of the sample.
- 4.4 When the applied load has reached 7000 kg pause the Instron and record the thickness of the ConduDisc, then restart the Instron.
- 4.5 When the applied load has reached 12 000 kg pause the Instron and record the thickness of the ConduDisc, then restart the Instron.
- 4.6 When the applied load has reached 14 500 kg pause the Instron and record the thickness of the ConduDisc, then restart the Instron.
- 4.7 When the applied load has reached 16 500 kg pause the Instron and record the thickness of the ConduDisc.
- 4.8 Leave the load of 16 500 kg applied to the sample for one minute, making any notes on the appearance of the ConduDisc. Record the maximum load applied to the ConduDisc.
- 4.9 After one minute release the applied load, and when the top steel plate of the Instron is no longer touching the top surface of the ConduDisc measure the thickness of the ConduDisc.
- 4.10 The Instron software will plot a graph of position in millimeters versus applied load in kilograms.
- 4.11 Compare the thickness of the ConduDisc after the completion of the compression testing to the thickness of the ConduDisc before the compression testing.
- 4.12 If the ConduDisc has returned to its original thickness (+/- 5%) after releasing the applied load and the ConduDisc is not damaged, then the compression experienced by the ConduDisc is determined to be elastic compression.
- 4.13 Report the compression, in millimeters, of the ConduDisc at the various applied loads.
- 4.14 Report the maximum load applied to the ConduDisc, in kilograms.
- 4.15 Report whether the ConduDisc experienced elastic compression.

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