



Application: Rubber Goods & Tools Testing

Application Description

Linemen tools, like rubber gloves and blankets, hot sticks, phasing sticks, and other items used to provide insulation protection from touching live voltage must be hipoted regularly to ensure their **dielectric withstand integrity**. This is normally an **AC Withstand** test, where the item is subject to a specified high voltage for a certain length of time. The item either holds the test voltage or it fails. If it fails the test, by arcing through the material, the defect location must be found and fixed or the item replaced. This method uses AC hipots to perform this over voltage pass/fail withstand test, as AC voltage simulates the operating stress on the item in service.

Some use DC voltage hipots instead of AC. Although AC hipoting provides a more certain determination of an item's AC dielectric integrity, there are accepted standards for the use of DC voltage. When using DC, an overvoltage is applied to the item and the μ As or mAs of leakage current through the material and/or tracking across its surface are measured and compared against a standard level for acceptance or failure. DC voltage hipots can also be used to perform an **Insulation Resistance (IR)** test, where the megohms of material resistance at the test voltage is measured and compared against some minimum resistance number permitted.

Selecting a Hipot

When selecting the hipot needed, the first specification to know is the test voltage require. The next criterion is the output current required. If a **DC hipot** is being selected, a model providing **5 mAs or 10 mAs** is fine for this type of testing. If an AC hipot is to be selected, the **user must know the current needed** for the test. **The current rating of an AC hipot is determined by the capacitance of the load.** Depending on the test object and how many are to be tested at once, the capacitance of the load may be quite high. If testing one hot stick, a 10 or 20 mA rated AC hipot would be sufficient. If testing 10 sticks at once or a rubber blanket, then a hipot ten times the current rating will be needed.

To find out the AC current draw, or how many mAs are needed by the test object at the desired test voltage, either refer to past similar tests, or test at a lower voltage and linearly scale up the mA's to the test voltage to be used, calculate the capacitance, or if the capacitance is known, calculate the amps directly by the following formula:

$$\text{Amps} = 2\pi fCV \quad f = \text{frequency in Hz} \quad C = \text{load capacitance in farads} \quad V = \text{test voltage in volts}$$

HVI Product Solutions

HVI can provide both **AC and DC** voltage instruments. Our DC hipots are rated from **20 kVdc – 600 kVdc**. Their current ratings vary from **3 mAdc – 10 mAdc**. They are designed for both portable field use and stationary factory or lab applications, depending on the model. The portable models also contain high voltage **Megohmmeters for IR testing**.

Our **AC hipots** range from **3 kVac – 300 kVac** with power ratings from **1 kVA – 40 kVA**. Some are designed to be corona free for **Partial Discharge** and **Tan Delta/Power Factor testing**.

Several control packages are available from simple manual control to PLC automated.

PFT Series AC Hipots
10 - 100 kVac, 1 - 3 kVA



PTS Series 20 - 600 kVdc
DC Hipot/Megohmmeters



ALT Series
AC Bucket Truck Testers
120/60 kVac & 200 kVac @ 7 kVA
Good for many applications

HPA Series AC Dielectric Test Sets
3 kVac - 300 kVac, 3 - 40 kVA
Field & Factory Control Options
Many Models Low PD Output

