Charge Producers and Proof Plane

ES-9057C

Introduction

The PASCO ES-9057C Charge Producers and Proof Plane are electrostatic components for use with additional equipment from the PASCO Basic Electrostatics System (ES-9080). The two charge producers are used to generate equal positive and negative charges by contact. The single proof plane can be used to measure charge density on a charged object.

Included

- Replacement Pad Set (ES-9056)

Recommended Equipment*

- Faraday Ice Pail (ES-9042A)
- Basic Electrometer (ES-9078)

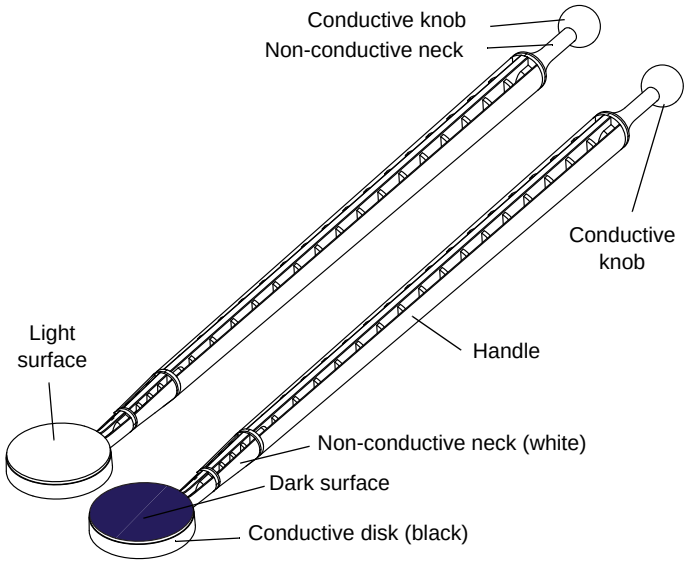
Related Equipment*

- Conductive Spheres (ES-9059C)
- Conductive Shapes (ES-9061)

**See the PASCO catalog or web site at www.pasco.com for more information.*

The Charge Producers

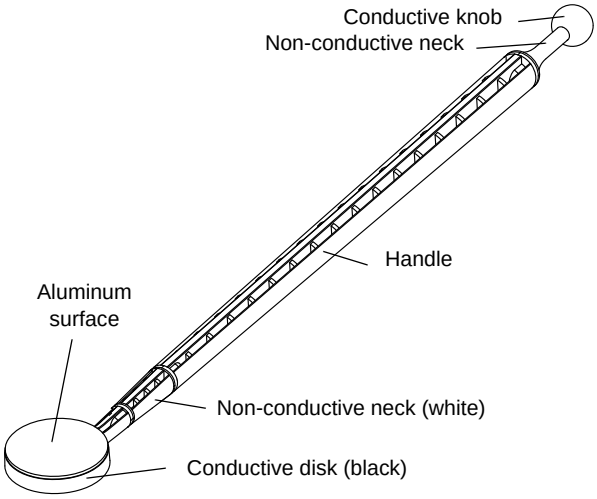
The charge producers consist of two wands, one with light material and one with dark material attached to a conductive disk.



Briskly rub the light and dark surfaces of the two charge producers together. The disk with the light surface will acquire a positive charge; the disk with the dark surface will acquire a negative charge. Rub the light surface charge producer against the proof plane. The white disk will acquire a negative charge, while the disk of the proof plane will acquire a positive charge.

Proof Plane

The proof plane is an aluminum-covered conductive disk attached to an insulated handle. It is used to sample the charge density on charged conductive surfaces.



***NOTE:** Oil build-up on the non-conductive neck can affect results. Clean with alcohol before using.*

- If a zero charge is desirable, discharge the charge producers by touching the conductive disk and handle to ground. To be sure the disk and handle is fully discharged, gently breathe on the non conductive neck. The moisture from your breath will help remove any stray charge.
- Avoid touching the neck during normal use. The oils from your hands will provide a path for charges to leak off. Occasionally clean the disk surfaces and the neck with alcohol.
- When you first use the charge producers, or just after cleaning, they may not produce charges readily. Rub the white surface vigorously on the conductive disk of the proof plane.

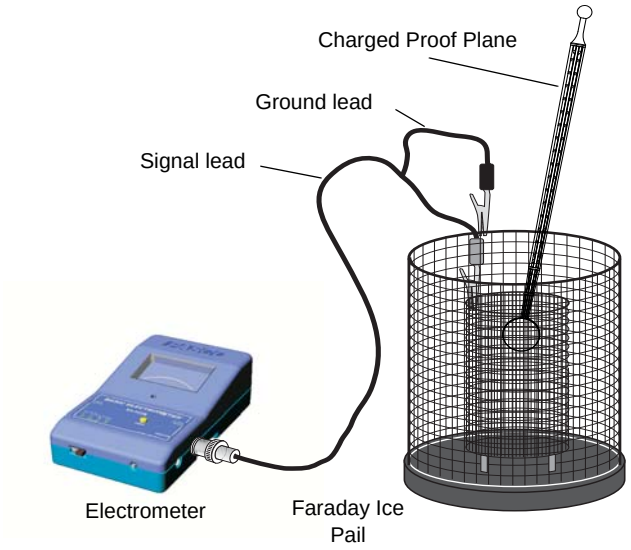
NOTE: *The charge producers are designed to be used with the basic electrometer (ES-9078). They do not produce sufficient charge for use with a standard electroscope.*

The conductive knob on the end of the charge producers and the proof plane is designed to be used with the Conductive Hollow Sphere from the PASCO ES-9061 Conductive Shapes apparatus. You can insert the knob through the hole on the top of the Conductive Hollow Sphere to sample the charge density on the inside of the sphere.

Other

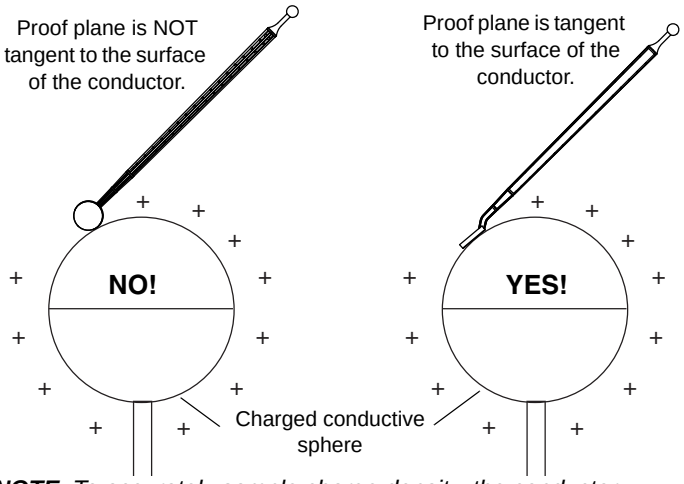
The conductive disk material is carbon-filled black polycarbonate (about $10^3\ \Omega$). The nonconductive neck is white polycarbonate (about $10^{14}\ \Omega$).

NOTE*: You can then use a PASCO Basic Electrometer and a Faraday Ice Pail (ES-9042A) to measure the charge density on the proof plane, as shown in the following illustration.*



By touching the proof plane to a surface, it will acquire the same charge distribution as the surface. By measuring the charge on the proof plane, the charge density on the surface can be determined. The greater the charge on the proof plane, the greater the charge density on the surface where the proof plane made contact.

When the proof plane is touched to a conductor, the proof plane becomes part of the conductive surface. If the effect on the shape of the surface is significant, the sampling of the charge density will not be accurate. Therefore, always touch the proof plane to the conductor in such a way as to minimize the distortion of the conductive surface. The following illustration shows the recommended method for using the proof plane to sample the charge on a conductive sphere.



NOTE*: To accurately sample charge density, the conductor should be considerably larger than the disk of the proof plane and have a relatively large radius of curvature at the point from which the sample is taken. However, the proof plane can be used to test for charge polarity on conductors of any shape.*

Replacement Pad Kit

The ES-9056 Replacement Pad Kit includes five dark surface pads and five light surface pads. When a surface pad on a Charge Producer becomes worn, remove as much of the old surface material as possible. Remove the cover from the adhesive backing on a new pad and carefully place the pad on the Charge Producer disk. Push against the new surface to ensure good adhesion.

Technical Support

For assistance with any PASCO product, contact PASCO at:

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For more information about the Charge Producers and Proof Plane visit the PASCO web site and enter ES-9057C in the Search window.