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## TECHNICAL INFORMATION

### Electrostatic Dust Print Lifter

#### Catalog No. ESP900

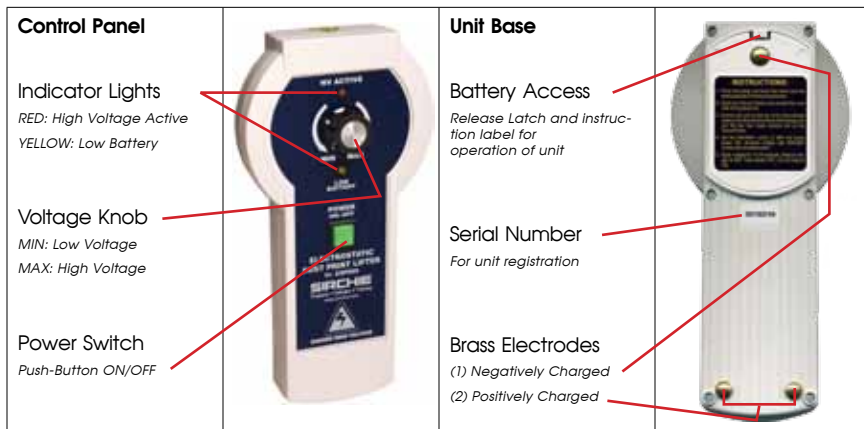
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#### Information

One of the most overlooked forms of physical evidence at the crime scene is impression evidence. Locating and recovering obvious kinds of impression evidence like tire tracks and footprints is not the problem. It's the not-so-obvious dust print impressions that are difficult to locate, accidentally damaged or obliterated. The Electrostatic Dust Print Lifter is designed specifically for lifting these dust prints from almost any surface from the floor, door, wall or windowsill to upholstered furniture using static electricity. High voltage is applied to a metallized lifting mat creating a negative charge and causing the ground plane to become positively charged. Any dust present under the mat will take on a positive charge, attracting it to the negatively charged mat. The resulting dust print lifted will be a precise mirrored image of the original print.



<b>Application</b>	Lifting dust prints from a variety of porous and non-porous surfaces whether horizontal, vertical, or curved.		
<b>Hazards/Safety Info</b>	<p><b>Warning!</b> Potential for electrical shock. Unit develops up to 10,000 volts of static electricity even though it operates at a low current.</p> <p><b>Caution!</b> Arching may occur between the pickup mat and surface. If so, reduce the charging voltage.</p> <p><b>Caution!</b> Do not touch charging mat or ground plane while voltage is being applied.</p> <p><b>Caution!</b> Always reduce charging voltage to MIN before turning unit off and discharge any residual voltage between the ground plane and pickup mat with the static discharge cable provided.</p>		
<b>ESP900 Contents</b>	<ul style="list-style-type: none"> <li>1- Electrostatic Voltage Control Unit</li> <li>1- Ground Plane, nickel-plated steel, 4' x 6' (10.2cm x 15.2cm)</li> <li>1- Ground Plane Polycarbonate Insulating Sheet, 5' x 7' (12.7cm x 17.8cm)</li> <li>1- Insulated Roller</li> <li>1- 9V Alkaline Battery</li> <li>1- Static Discharge Cable</li> <li>1- ESP901 Metallized Lifting Mats in protective tube, 5 ea.</li> <li>1- Technical Information</li> <li>1- Instructional DVD</li> <li>1- Black Molded Copolymer Case; Dimensions: 12.25" x 9" x 3.875" (31.1cm x 22.9cm x 9.8cm); Weight: 3.1 lbs. (1.4kg)</li> </ul>	<b>Optional Accessory Items/ Reorder Items</b>	<ul style="list-style-type: none"> <li>ESP901 ....2' x 3' Lifting Mats, 5 ea.</li> <li>ESP902 ....2' x 3' Lifting Mats, 10 ea.</li> <li>ESP903 ....2' x 3' Lifting Mats, 15 ea.</li> <li>ESP904 ....1' x 2' Lifting Mats, 50 ea.</li> <li>ESP905 ....25' roll Lifting Material</li> <li>ESP906 ....50' roll Lifting Material</li> <li>ESP908 ....Lifting Mat Evidence Box (39" x 27" x 1") w/(1) evidence label and (3) EIL02 evidence seals</li> <li>ESP909 ....(10) Lifting Mat Evidence Boxes (39" x 27" x 1") w/(10) evidence label and (30) EIL02 evidence seals</li> </ul>



## Battery Installation

The Electrostatic Dust Print Lifter is powered by a single 9V alkaline battery. The battery storage compartment is located on the unit base as shown above. A single negatively charged brass electrode protrudes through the battery compartment cover.

1. Just below the brass electrode on the bottom of the unit is a release latch. Using a fingernail, move the latch down and remove the cover. The battery is installed in the bottom compartment.

2. Observe the polarity of the replacement battery. The “+” terminal is at the top terminal in the compartment (shown to the right). Refer to label inside battery compartment.
3. Push the battery into place. A small plastic spacer tab is located at the right end of the battery compartment. Be certain that the battery is just to the left of this spacer tab and that the battery terminals make contact with the terminals in the battery compartment.
4. With the battery in position, replace the compartment cover.



**BATTERY COMPARTMENT**

The unit is ready for use. Press the ON/OFF switch. The green button should illuminate. **NOTE:** Energizing the unit will not produce an electrical charge (see OPERATION below). Battery life varies with use. A fresh alkaline battery will provide about 150-200 lifts using a 15 second charging cycle. Shortly before battery life expires, the Low Battery light will illuminate.

## Operation

It is possible to locate dust impressions on floors and other surfaces by employing oblique light in a darkened room. The texture of the surface or strong design patterns, however, may make this more difficult. Whether prints are visible or not, the search for them should be directed toward areas most likely traveled by the perpetrator. This would include hallways, foyers and the area nearest to the point of entrance and exit.

1. Remove one of the pickup mats from its protective tube. Carefully place the mat, black side down, over the area to be examined. **NOTE:** When working on vertical surfaces, secure the pickup mat in place with masking tape.
2. Position the Ground Plane 1-2 inches from one edge of the pickup mat as shown (Fig. 1A).
3. Place the electrostatic control unit on the ground plane and the pickup mat. The single brass electrode must make contact with the metallized surface of the pickup mat and the 2 brass electrodes at the other

end of the unit must contact the ground plane.

**NOTE:** When working on a vertical surface (Fig. 1B), secure the Ground Plane in place with masking tape.

4. Set the voltage control to MIN. Press the ON/OFF button. The button should illuminate and the red LED above the voltage control knob should also illuminate. If the red LED does not come on, make sure the brass electrodes are making good contact with the ground plane.
5. Advance MIN-MAX voltage control to the 10 o'clock position.
6. On most surfaces, application of the electrical charge will cause the pickup mat to draw down to the surface. If not, advance the voltage control to a higher value. You will not receive an electrical shock by touching this knob, provided that your other hand is not touching any other surface. Touching the pickup mat or ground plane while the charge is being applied, however, could result in electrical shock.
7. While the unit is charging, use the insulated roller to flatten out any air bubbles between the mat and the surface being examined (Fig. 2).
8. Normal charging time is approximately 15-30 seconds. Longer charging produces better results, but will shorten battery life.
9. Reduce the voltage control to MIN and turn the unit OFF. Lift the mat and examine the black surface for dust prints.



FIGURE 1A



FIGURE 1B



FIGURE 2

### Lifting Dust Prints from Metal Surfaces

When lifting prints from metal surfaces such as desktops, vehicle bodies or metal cabinets, begin with the voltage control set at MIN (fully counterclockwise). Place the ground plane insulating sheet within an inch of the pickup mat (Fig. 3). Center the ground plane on the insulating sheet leaving a 1/2" border around the ground plane. Failure to use the Ground Plane Insulator may result in arcing between the pickup mat and the metal surface of the pickup mat and may damage the surface being tested.

1. Switch the power ON and slowly increase voltage. On most metal surfaces, it will not be possible to use full (MAX) voltage. Allow a charge for at least 15 seconds (30 seconds max).
2. After the charging cycle is complete, reduce the charging voltage to MIN, switch OFF the unit and set it aside. Using the Static Discharge Cable, press and hold the plungers on both ends of the cable. This exposes a metal contact at each end. Touch one contact to the ground plane and the other to the metallized surface of the pickup mat simultaneously to discharge any residual charge left in the mat (Fig. 4).
3. Carefully, lift and examine the pick up mat (Fig. 5). It may not always be possible to see some of the lifted prints due to low contrast of the dust with the black mat surface. Therefore, examine the mat using oblique light.



FIGURE 3



FIGURE 4



FIGURE 5

### Preserving Lifted Dust Prints

Photograph lifted dust prints and be certain to include a scale. The prints may be lifted from the pickup mat using Rubber Footprint Lifter No. 647C100 or SIRCHIE's GELifters™.

**CAUTION!** Attempts to add clear lacquer or similar materials to preserve the print on the lifting mat usually results in the destruction of lifted prints.

**CAUTION!** Do not use lifting tape or residue lifters other than those recommended above—it is nearly impossible to separate the device from the mat. Static electricity may also cause the mat to be drawn to the tape prematurely, damaging the lift.

**NOTE:** Discard mats after the prints are recorded. While it may be possible to clean the mat, wrinkles and scratches will develop across the surface and interfere with results from subsequent lifts.

### Transporting Lifting Mats

If the dust print lift must be transported to the lab for analysis, we recommend the use of ESP908 Dust Print Evidence Box. Each evidence box is supplied with an evidence label for identification and chain of possession purposes. Secure the pickup mat (black side up) inside the transportation box with tape as shown to the right (Fig. 6) and seal the box with three evidence integrity seals. Affix the evidence identification label to the outside (Fig. 7) and complete the information for transportation to the lab.



FIGURE 6



FIGURE 7

### References

Bodziac, William J., **Footwear Impression Evidence**, New York: Elsevier Science Publishing Co.: 1990, p103

Saferstein, Richard, Ph.D., **Criminalistics, Sixth Edition**, New Jersey: Prentis Hall: 1998, p324

Crime-Scene-Investigator, Dwayne S. Hilderbrand, CLPE: **Footwear, The Missed Evidence**, <<http://www.crime-scene-investigator.net/footwear.html>> February 2009

Troubleshooting		
Problem	Possible Causes	Solution
Unit does not turn on	Battery not installed	Install 9V alkaline battery
	Battery installed incorrectly	Check polarity
	Battery dead	Install new 9V alkaline battery
	Power switch isn't ON	Push switch in to turn ON
	Problem with internal circuitry	Return to factory for repair. <b>NOTE: Do not attempt repairs, disassemble or alter unit as this will void your warranty.</b>
No dust prints on pickup mat	There were no dust prints present	N/A
	Lifting mat didn't draw down completely to surface	Check positioning of brass contacts between the mat and ground plane
		Increase voltage setting
Brass contacts positioned incorrectly	Check positioning of brass contacts between the mat and ground plane	
Lifted dust prints are very light	Lifting mat didn't draw down completely to surface	Check positioning of brass contacts between the mat and ground plane
		Increase voltage setting
	Brass contacts positioned incorrectly	Check positioning of brass contacts between the mat and ground plane
	Not all dust offers high contrast	Darken room and use oblique lighting to examine