

September 28, 2005

**Re: Carbon Conductive Tabs**

Dear Customer

Thank you for taking the time to give us your feedback.

**Background:**

The original Carbon Tabs were made from the same material as the IBM typewriter ribbons. Since the demand for these ribbons declined so did the material for the carbon tabs. This base material was finally discontinued from production. A new type of carbon tab was located but they were thick and stiff and not sticky enough. In addition they were virtually non-conductive with a resistance in the Meg ohms. Many customers considered them unusable. They had however a smooth surface which did not crack under heat and vacuum, making them desirable for work with powders and pollens.

**New PELCO Tabs**

Since April 2004 we have offered our own product, PELCO Tabs. They are thinner, stickier and more conductive to address customer comm. The new PELCO Tabs are sold under the same product codes, 16084-1, -2, and -3. They are of the same thickness as the original tabs, 0.1mm. The price is the same. They were independently tested and it was found that our new tabs performed very well. and for most applications we received favorable feedback.

We received however complaints from customers who developed processes around the thicker tab including the need to remove and reposition the tab. None of our other carbon conductive tabs or tapes address this requirement. Some customers find that the double sided conductive copper tape will allow repositioning. This tape is a copper foil with nickel filled acrylic adhesive on both sides. It needs to be cut to size (Product code 16074, ½ inch by 18 yards).

**Helpful Hints**

Some issues such as being more difficult to remove from the clear liner can be overcome by changing techniques. If you need to remove the tab with the white liner intact try using our l#505 sharp tweezers (No. 505 Dumont style 5 tweezers) to lift the tab and white cover. Handling with tweezers eliminates many of the problems of sticking to itself. Alternatively you can cut the clear liner into strips, remove the white liner, press the tab onto the mount and then peel back the clear liner.

**Using the Tab as Photographic Background**

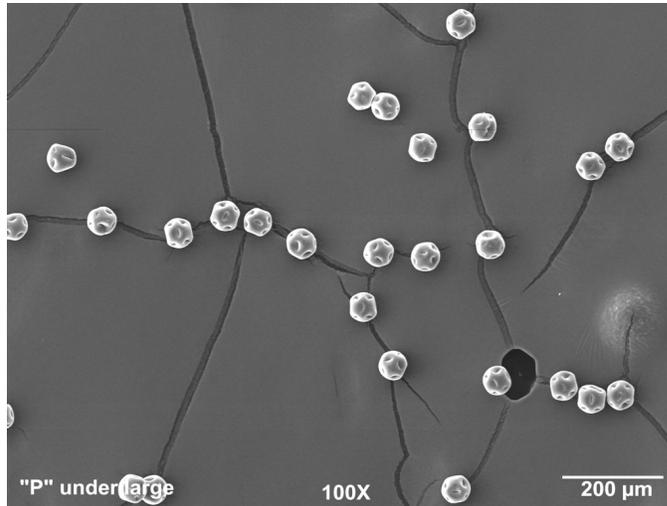
Researchers using these tabs with pollen or powders will find that carbon tabs tend to craze and bubble under vacuum. It is not a function of it being old or improperly stored but a characteristic of all the raw double sided adhesive thin carbon material available. There is a side to side difference in the surface texture of the tabs. The surface in contact with the clear plastic substrate does not outgas and while it has more textural discontinuities than some researchers prefer it works well enough for most applications. Samples of all available conductive carbon tabs were tested for use with pollen and it was found that all performed similar to our PELCO Tab and there is no better tab available which we could recommend.

### **Technique to Provide a Smoother Background**

One of our customers has developed the following technique for providing a smooth background for photographing pollen. While placing tabs under vacuum seems to cause more pot marks, heating it by sputter coating is causing cracking. It appears like mud cracking where the material is constrained by the adhesive and then solvents are evaporated under heat and cracking occurs. To overcome the cracking a piece of cellophane tape (double coated tape by 3M #137) was cantilevered on a fulcrum above the mount while sputter coating it. The fulcrum is formed by rolling up a PELCO Tab. The result was that the tape did not crack. (See photographs). This however cannot be done with Carbon Tabs since they are too thin to support themselves. Perhaps choosing sputter conditions that reduce heating might help.

A new tab was recently announced and we evaluated them as well. They are of the same 0.10mm thickness, are just as sticky and also crack under vacuum coating. We found nickel fibers in the tab which gives high Ni peaks in the EDS spectrum.

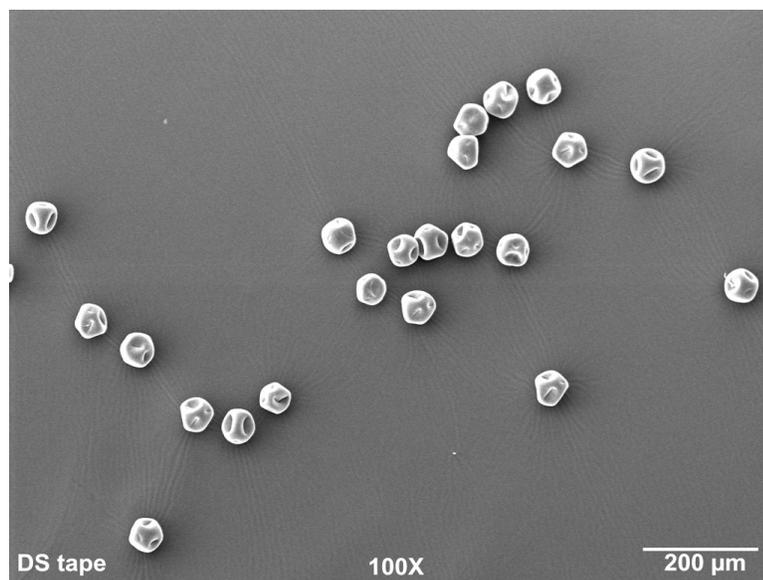
In conclusion it is found that the PELCO Carbon tab works well for most applications and is as good if not better than any competitive tab. We hope that these tips will assist you in getting the quality of pictures for which you strive.



Pollen on Conductive Tabs



Cantilevered 3M tape



Pollen on Cantilevered 3M Tape