Application Note 1097-203

VSM Oven Sample Mounting Techniques

Introduction

Currently there are two main ways to mount a sample for use in the VSM oven; Wet Mounting and Dry Mounting. The decision to mount a particular way is dependent on several variables. If the sample is unaffected by moisture, heat, or is thicker than 0.5mm, then wet mounting is best suited. If the sample's properties may change due to exposure to moisture or heat then the dry mounting procedure is advisable. Wet mounting affixes the sample to the heater by means of Zircar Cement. The Dry mount affixes the sample by means of mechanical force. When a sample is properly mounted, the dry mounting method produces near identical result as compared to the traditional wet mounting. In fact, dry mounting can yield better result if the sample has a good flat surface as a larger surface area leads to better thermal conductance between the heater and sample. Another advantage of dry mounting is the decreased wear on the heater stick: in wet mounting technique one must scrape off the dried cement on the heater region with a wood or plastic tool before mounting a new sample.

Wet Mounting

VSM oven measurements can be done by mounting a sample onto the heater stick using Zircar cement as an adhesive (see *Figure 1*). The user applies a small amount of wet cement to the heater and attaches sample to it. Then a heat gun is used to dry the cement. Once the cement has dried and the sample is secured firmly in place, the copper foil is wrapped around the heater stick and the measurement can be taken. See VSM oven training videos on YouTube channel Quantum Design USA here.

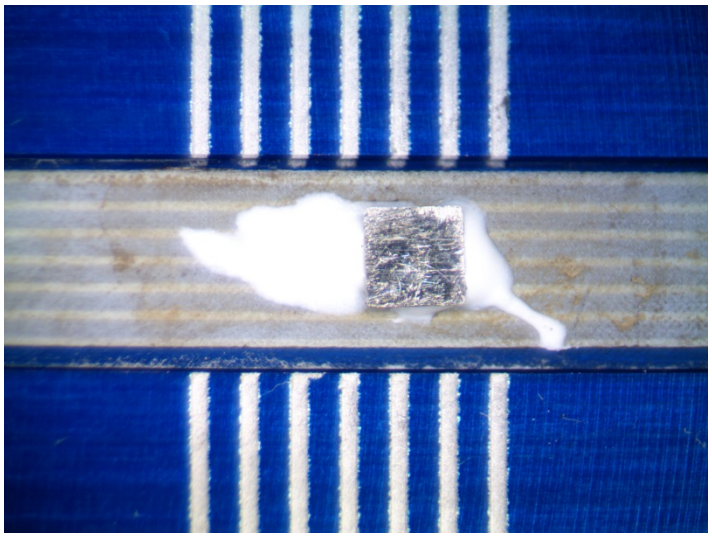


Figure 1: Zircar cement with Nickel

Dry Mounting

VSM oven measurements can be done by mounting a sample onto the heater stick using mechanical force (see *Figure 2.*). The procedure for this mounting is slightly more involved than the wet mounting and is detailed below.

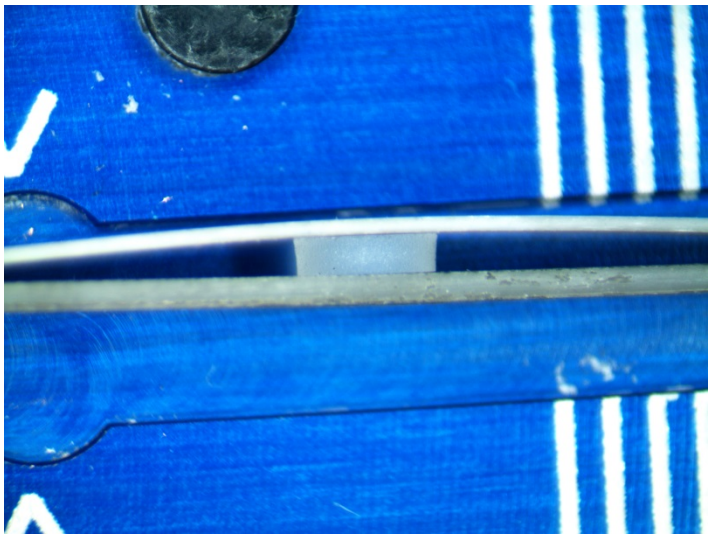
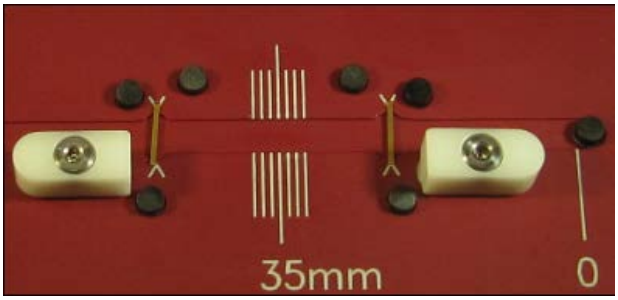
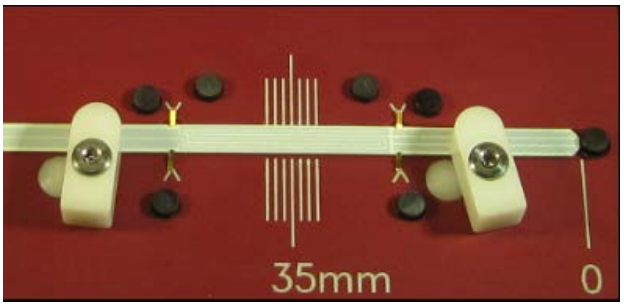


Figure 2: Dry mounting: side view of a thin film sample mounted to the stick before the Cu foil shield is applied.

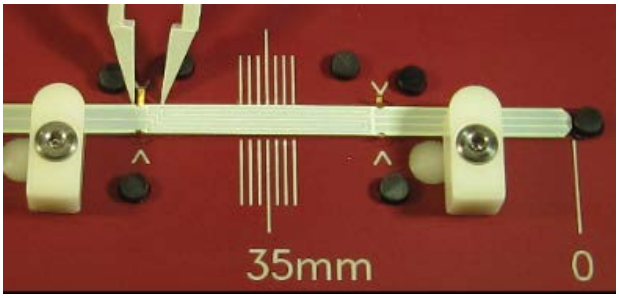
1. Place a Dry Mount Staple (4097-004) in each of the associated grooves, indicated by the arrows on the Sample Mounting Platform.



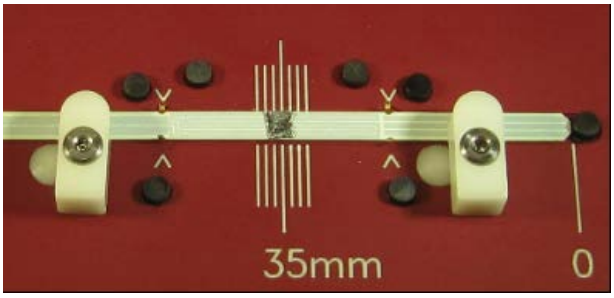
2. Insert the VSM Oven Heater Stick (4097-050) into the Sample Mounting Platform. Lock into place by rotating the stick securing tabs.



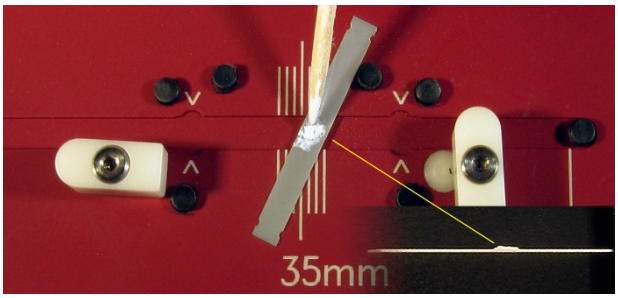
3. Using the supplied Delrin Tweezers (HM118); adjust the Staples so that they are in line with the indentations alongside the VSM Oven Stick. Bend the Staples so that they stick upward.



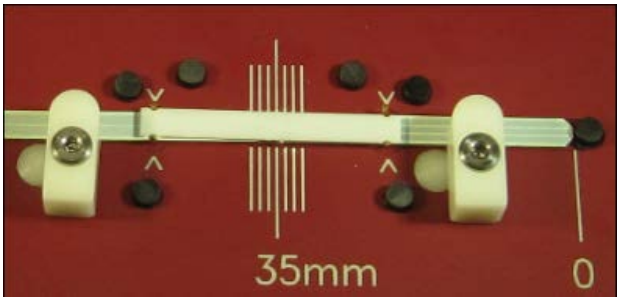
4. Place your sample onto the VSM Oven Stick; centered at the "35mm" mark on the Sample Mounting Platform. Sample must be LESS THAN 0.5mm thick to use dry mount method.



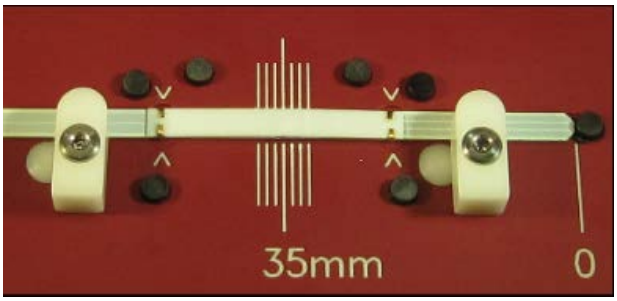
5. Do this step ONLY If your sample is LESS THAN 0.2mm thick. Place a small bump of Zircar cement onto a side of the Dry Mount Plate (4097-003). Using a heat gun, dry the Zircar cement.



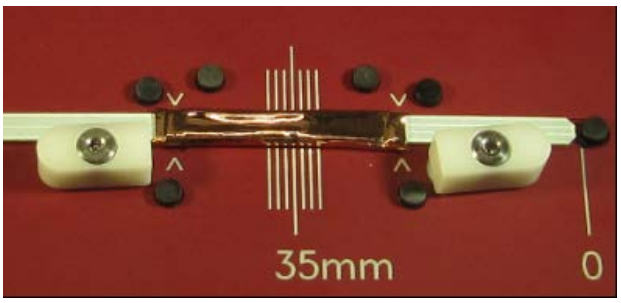
6. Place a Dry Mount Plate (4097-003) on top of the sample and align the indentations on the Dry Mount Plate with the indentations on the VSM Oven Stick. Use the previously bent staples as a guide.



7. Bend the Dry Mount Staples around the Dry Mount Plate to secure the sample in place. Apply only as much force as needed to secure the Plate firmly in place. Too much force may break the Plate; too little force will not secure the sample in place.



8. Finally; wrap dry mounted stick with the Dry Mount Foil (4505-141). Secure the Foil in place by crimping it around the edges of the Staples. You can use your fingernails or the side of the Delrin Tweezers to create the crease around the edges of the Staples.



After finishing, make sure that the foil and the Dry Mount Plate do not slip when pushed along the length of the stick. This is crucial in data collection as slippage of material on the sample holder will create large noise and a background signal.