Standard Operating Procedure

EMS 150T ES Carbon Coater

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| **Department:** | Earth and Environmental Sciences |
| **Date SOP was written:** | 3/31/2020 |
| **Date SOP was approved by PI/lab supervisor:** | 3/31/2020 |
| **Principal Investigator:** | Guil Gualda |
| **Internal Lab Safety Coordinator/Lab Manager:** | Richard Bradshaw |
| **Lab Phone:** | Click here to enter text. |
| **Office Phone:** | G. Gualda (615) 322-2976 (campus phone: 3-2976)  R. Bradshaw (615) 343-0839 (campus phone: 3-0839) |
| **Emergency Contact:** | G. Gualda (615)-988-8230 (cell)  R. Bradshaw (208) 260-2792 (cell) |
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| **Location(s) covered by this SOP:** | SC 1110C |
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**Personal Protective Equipment (PPE):**

Nitrile Gloves

**Eye/Hearing Protection:**

**Other Protection:**

**Medical Emergency Dial (615) 322-2222 for Vanderbilt Police**

**Life Threatening Emergency, After Hours, Weekends and Holidays** – Dial **(615) 322-2222 for Vanderbilt Police** or go to the nearest emergency room. *Note: All serious injuries must be reported to Environmental Health and Safety (EH&S) within 8 hours.*

**Non-Life Threatening Emergency** – Go to the Occupational Health Facility (OHF). After hours, go to the nearest emergency room. *Note: All serious injuries must be reported to EH&S within 8 hours.*

NOTE: Reading this SOP does not give you permission to use this carbon coater, you MUST be trained by the Lab Manager on the proper use. This SOP is meant as a reminder of the procedure and safety information, not a comprehensive set of instructions.

**Procedure**

Preparing the carbon rods

* On the screen, navigate to the “QT Vent chamber” profile on the dropdown menu, then click run
* Once the vacuum chamber has vented, open the lid by lifting the black handle on the front
* The carbon rods are located under the lid
* Remove the carbon rods (2) using the silver allen wrench on the bench
* Each rod will need to be at least 1.5 inches long
  + There are more carbon rods in the cabinet beneath the carbon coater
* The tip of one rod needs to be ground flat using the sand paper on the bench, place this rod in the assembly on the right with the flat tip centered in the assembly
* The tip of the other rod needs to be ground flat on the sand paper, then shaped to a smaller point using the shaping tool (it should be on the bench and it has a blue knob on the end)
  + This tool is similar to a pencil sharpener, you put the rod in it and secure it with the set screw
  + Turn the blue knob clockwise while applying a small amount of pressure on it to shave away small amounts of the carbon until it no longer is shaving any more
  + The smaller diameter part of the rod should be ~2-3 mm long
  + Place this rod in the assembly on the left by pulling the spring-loaded part of it out, then tightening the set screw just enough to hold it

Preparing your samples

* This coater can coat up to four 1-inch round mounts, or two standard thin sections at a time
* Make sure your samples are clean and dry
  + Wipe the surface you are going to carbon coat with ethanol and a Kim Wipe
  + Then wipe it with DI water and a Kim Wipe and quickly dry it with a dry Kim Wipe (the ethanol seems to leave a thin film on the surface causing an uneven coat)
* Place your samples on the circular rotating stage
* Close the lid

Coat your samples

* Select the “Carbon 1 Sec” profile from the dropdown menu, then select “Run”
* The vacuum chamber will pump down
* Once it gets to the “Pump Hold” dialog box, you can select continue
* The machine will heat up the carbon rods in several “pulses”
* For a light coat (for CL imaging, EBSD, etc.) hold the stylus over the cancel button in the top right and cancel the procedure as soon as you see any sparks from the rods

Finishing up

* Once the procedure ends, or you cancel it, it should vent the chamber
  + If this does not happen, select “QT Vent chamber” from the dropdown then select run
* Once the chamber has vented, open the lid and remove your samples
* Close the lid, then select “QT Vacuum shutdown” from the dropdown then select run
* Make sure the bench is clean

**Documentation of Training** (signature of all users is required)

* Prior to conducting any work, the PI or LM must provide training to his/her laboratory personnel specific to the hazards involved in working with this equipment, work area, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP.
* The Principal Investigator must ensure that their laboratory personnel have attended appropriate laboratory safety training and are current with any refresher training required.

**I have read and understand the content of this SOP, and have completed the accompanying safety checklist:**

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| **Name** | **Signature** | **Date** |
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