Title:	Standard Procedures to use the Carbon Coater
Issue Date:	July 15, 2019
SOP#	SOP-EMC-YANG-031
Revision #	1

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Author of this Revision: Date:

First Name, Last Name, Title (i.e Ph.D)

Role (ie. Professor, Department of Biology)

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Reviewed by: Date:

First Name, Last Name, Title

Role

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Approved by: Date:

First Name, Last Name, Title

Role

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Authorized by: Date:

First Name, Last Name, Title

Role

1.0 **Purpose**:

The aim of this guideline is to inform all personnel who use the sputter coater about the proper procedures, safety concerns and to maximize the degree of efficiency.

2.0 **Scope and Applicability**:

The purpose of sputter coating is to apply a thin layer of a carbon to non-conducting specimen. This prevents charge build-up in sample while under the electron beam. This document applies to any personnel who will be using the carbon coater to coat samples.

	Department, Lab or Center: Electron Microscopy Centre
	Research Group:
	Lab Bldg., Room(s): Science Building, Suite 001C
	Operation/Experiment:

3.0 **Responsibilities**:

Users shall perform the following procedure within the EM Lab (S001C) regarding the coating of samples. Only trained personnel should operate this equipment.

4.0 **Health, Safety and Environmental Considerations**:

4.1 **Materials and Hazards**

Principal Materials Used	Flammable	Corrosive	Sensitizer	Mutagen	Teratogen	Biological Toxin	Acutely Toxic	Pyrophoric	Water-Reactive	Shock Sensitive	Carcinogen	Unstable	Other Comments
Carbon Thread													

MSDS attached		Yes	If not, please explain: Not Applicable
		No	

Describe equipment/instrumentation used to monitor/control hazards:

	Permits:
	Mgmt. Approval:
	Training:
	Medical Surveillance:
	Other:

4.3 **Special Emergency Procedures**

Fire/Evacuation:	
Chemical Spill:	
Medical Emergency:	
Personal Exposure:	

5.0 **Equipment and Supplies**:

Material(s) and Equipment:	
	Material: Carbon Thread Equipment: Leica EMCED030 Carbon Coater , forceps

Special PPE Required:		
X	Goggles	
	Face Shield	
	Chemical Resistant Apron	
X	Protective Clothing: Lab Coat	
X	Gloves	
		Butyl
		Nitrile
		PVC
		Latex

		Neoprene
		Silver Shield brand
		Kevlar
	X	Other: Powder free gloves
	Respirator (If yes, contact EHS Office for additional assistance)	
Note: If special PPE and/or protective clothing is not required, standard PPE and protective clothing required in Part II. of the Department Chemical Hygiene Plan must be utilized.		

6.0 **Terms and Definitions**:

Not Applicable

7.0 **Procedure**:

1. Remove the metal top plate carefully and place into the groove on the machine top.
2. Mount small dried specimens onto SEM stub with double-sized tape or conductive glue. Place the stubs into the holes on the specimen table. For large samples, they can simply laid on the table.
3. Mount the carbon thread in the evaporation flange. Either single or double carbon threads can be used to apply carbon films by evaporation.
4. Re-place the top plate back on.
5. Evacuate the chamber until the vacuum display is in the area.
6. Tap the UP key (15-18 times) until the carbon thread begins to glow red. If necessary, reduce the current using the DOWN key. The degassing process takes 15-20 seconds.
7. Repeat step 6 once or twice if necessary. Press RESET key to end the degassing process.
8. Evaporate the carbon thread by pushing the HIGH CURRENT key. It takes a single carbon thread approx. 3 seconds to burn through, and a double carbon thread approx. 6 seconds.
9. If it lasts less than a second, the carbon thread is burnt prematurely. It is necessary to repeat the carbon coating process, starting from step 2.

10. Vent the chamber by turning off the unit.

11. Wait until the pressure in the chamber reaches atmosphere pressure. Open the cover and remove the specimens.

12. Replace top plate.

13. Record the usage of carbon coater on the logbook.

Task	Hazards	Precautions

8.0 **References**:

Not Applicable

9.0 **Revision History**:

Rev #	Revision Date	Review Date	SOP Section(s)	Revision Description	Revised By
0	July 15, 2019			SOP-EMC-YANG-031 created	Xiang Yang
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