Jun 13, 2025

SEM Metal Sputter Coater User Guide

DOI
dx.doi.org/10.17504/protocols.io.yxmvmxjynl3p/v1

Dakota Betz[1]

[1]ucsd

Rouse Lab

Marina McCowin
UCSD- Scripps Institution of Oceanography

DOI: dx.doi.org/10.17504/protocols.io.yxmvmxjynl3p/v1

Protocol Citation: Dakota Betz 2025. SEM Metal Sputter Coater User Guide. **protocols.io https://dx.doi.org/10.17504/protocols.io.yxmvmxjynl3p/v1**

Protocol status: Working
We use this protocol and it's working

Created: June 16, 2020

Last Modified: June 13, 2025

Protocol Integer ID: 38236

Abstract

How to use the SEM Metal Sputter Coater at SIO.

1 To put specimens in the sputter coater, WITH **GLOVES**, carefully open the canister lid and with your non-dominant hand pick up the glass cylinder from the top. (*Do not lay the glass cylinder down*
on the table top, hold it).

1.1 You can put up to 7 stubs in at a time. Use the stub tweezers to place your samples into the holder.

1.2 Reposition the glass cylinder, making sure no dust got on the margin (if there is dust, wipe it off with your other gloved hand by running your finger along the margin). Close the lid.

2 Make sure **VENT** and **LEAK** knobs are turned all the way **clockwise** = closed. (*Finger tight*).

3 Turn on the Argon (gas cylinder in the corner of the room, the first one (check that it doesn't say nitrogen), turn the knob to the left just until you feel it give way and Ar starts to flow).

4 Hold the lid of the chamber down, press **START PUMP** and wait ~5s until a vacuum is created and the “Chamber Pressure” needle is between 10^-8 and 10^-6 mbar.

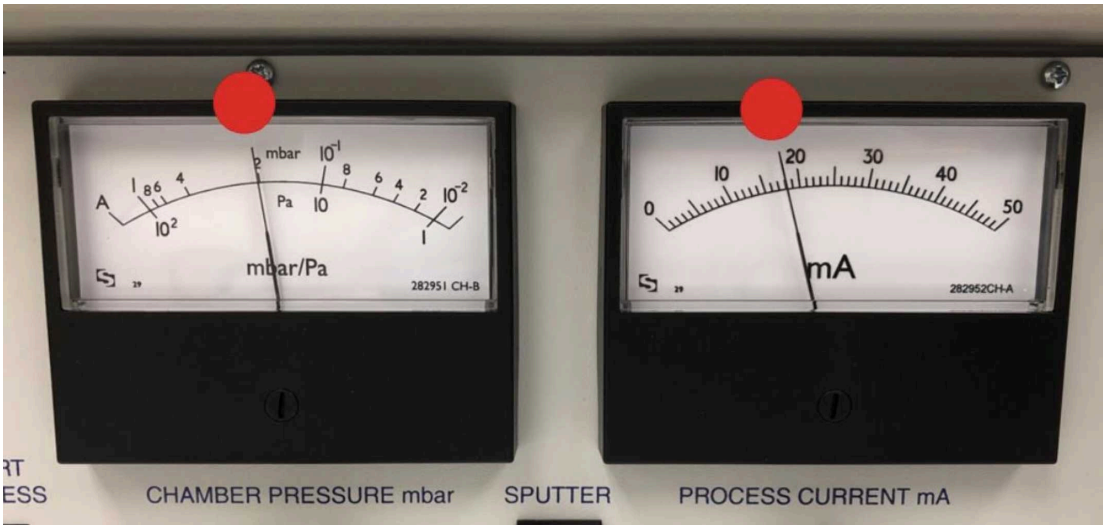
5 Now you want to exchange the air in the chamber with Argon. Do so by twisting the **LEAK** knob **counter-clockwise**. The needle on the "chamber pressure"gauge will drop to(wards) A. *You are flooding the chamber with argon.*

6 Twist the **LEAK** knob clockwise finger tight and wait until the pressure needle goes down to 10^-6 or even further to the right.

Repeat this flooding process three times to fill the chamber with argon, and rid atmospheric air/gases from the specimens. The *VENT knob should be left closed during this entire time.*

7 Make sure the timer is set to 120 seconds (TIME-SECONDS knob).

8 Press down and hold the **SET PLASMA** button, and continue pressing while twisting the **LEAK** knob **counter-clockwise** again until the pressure is at **~2 mbar** and the current in the "PROCESS CURRENT" gauge is at **~18mA**. *The chamber will turn purple.*



9 Release the **SET PLASMA** button and then quickly push the **START PROCESS** button. The chamber will continue glowing purple - this is the plasma you are seeing! (SO COOL!)

10 Continue adjusting the **LEAK** knob to keep the current at **18mA**.

11 The machine will stop by itself after the allotted time.

Close the **LEAK** valve.

Turn off the **PUMP**.

Vent the chamber by twisting **VENT** knob **counter-clockwise** until the pressure needle is around **A**, then close the **VENT** knob by twisting it **clockwise** to finger tight.

12 Turn off the argon.

13 If you are done, carefully remove your specimens, but usually (at least for worms in the Rouse Lab) you will want to do a second coat.

14 Second coat: Open the lid, pick up the glass cylinder as before, but now carefully **turn your samples by 90 degrees** with the tweezers. The easiest way to do this is to look at what direction the aluminum tape on the stub is pointing, and try and remember that and turn it so that the new direction forms a right angle with the old one. Make sure you remember which stubs you've already rotated and which ones you haven't!

15 Repeat the process from steps 1.2 to 12.

16 Take out your specimens by opening the lid of the chamber, removing and holding the glass cylinder in your non-dominant hand, and using your dominant hand to remove your samples and put them back in their place in your box.