

# Filament Exchange

1. Turn off HV – from menu or by pressing HV button twice in succession.
2. Isolate the column by pushing (out position) the Evac button.
3. Press the Air button.
4. Unscrew the cap.
5. Loosen the thumb screw.
6. Turn the Wehnelt cap counterclockwise  $\sim 90^\circ$  and pull down and out.
7. Put cap in jig.
8. Loosen the 4 set screws that hold the filament and remove it.
9. Align the new filament with the notches.
10. Eyeball the filament to center with the set screws.
11. Put the Wehnelt cap back on – rise tool.
12. Hold the cap assembly at  $\sim 45^\circ$  to align the tip of the filament with the top of the cap.
13. Center the filament with the set screws – stereo microscope.
14. Back off Wehnelt cap 1/3 turn. (The tip of the filament needs to be 0.2-0.5 mm. from the top of the cap. One turn of cap = 0.5 mm.)
15. Align notch in cap assembly with thumbscrew.
16. Push cap assembly up and turn clockwise  $90^\circ$ .
17. With clockwise pressure on cap assembly, tighten the thumbscrew - snug. (*Make sure that you don't tighten the Wehnelt.*)
18. Replace outer cap – snug.
19. Check O-ring.
20. Press Air button – off.
21. Press Evac button – on.
22. When column ready – press HV button.
23. Go to Fil/Bias window and make sure filament is saturated and not oversaturated – 18-22 V. for tungsten.
24. If over 22 V. remove outer cap again and turn Wehnelt 1/8 turn clockwise.
25. If there is no beam current:
  - Filament is blown.
  - Filament legs aren't making contact either because Wehnelt assembly not fully seated (clockwise) or filament legs weren't lined up with the notches when replaced.
  - Wehnelt cap too far away from filament.