



# IG2 Filament Change Procedure

*Supplement*



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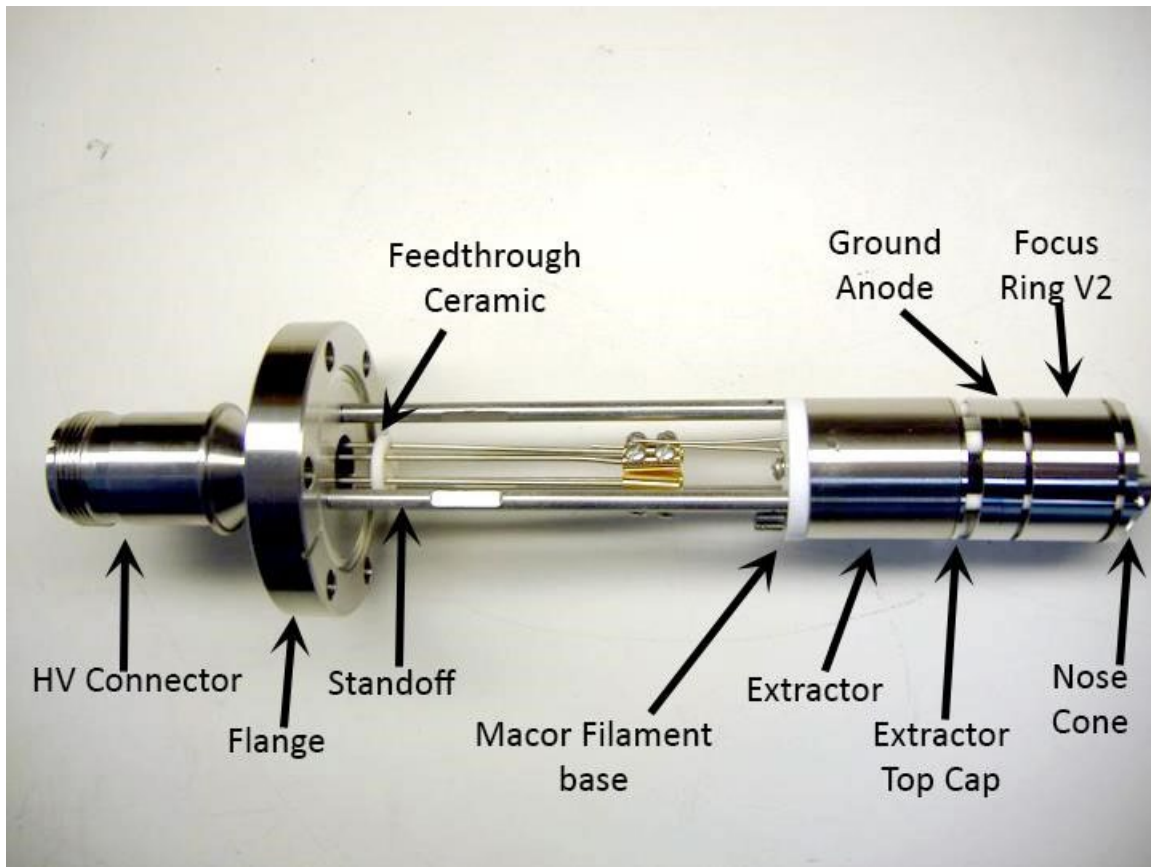
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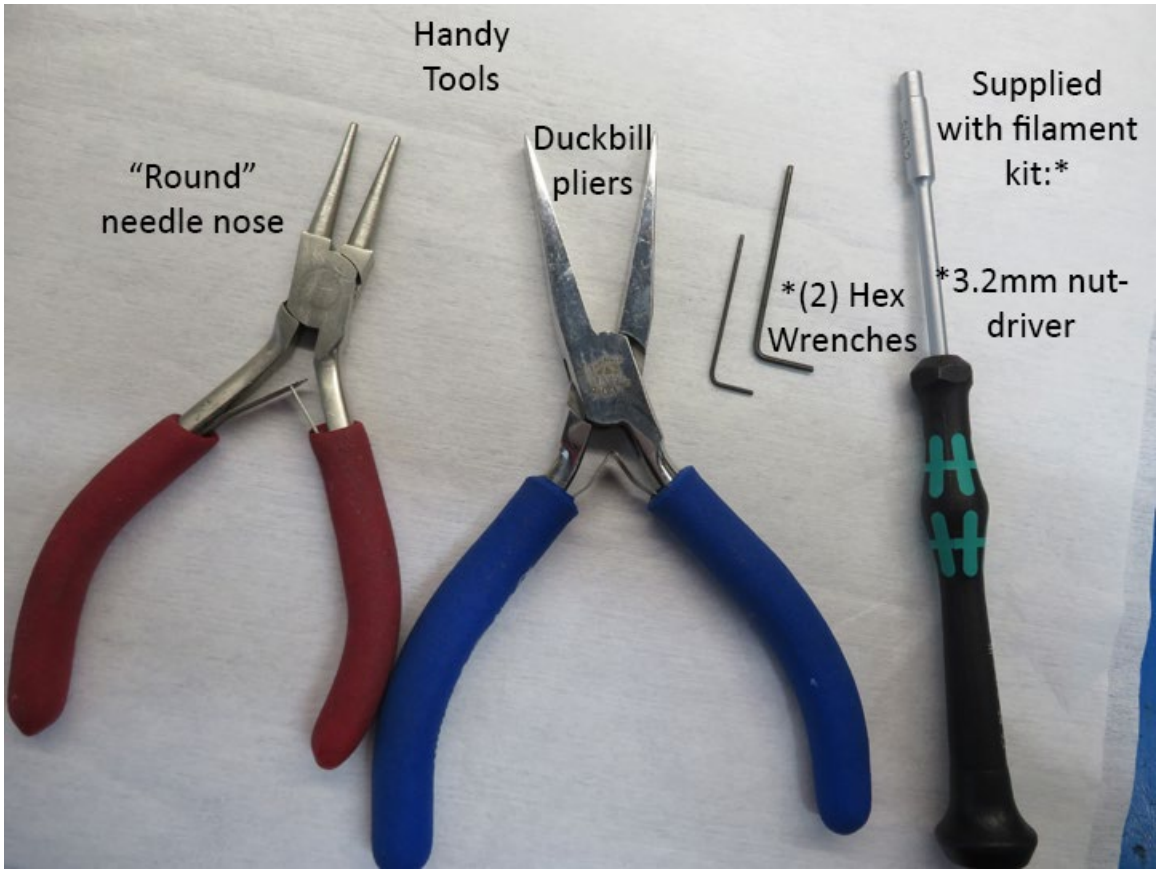
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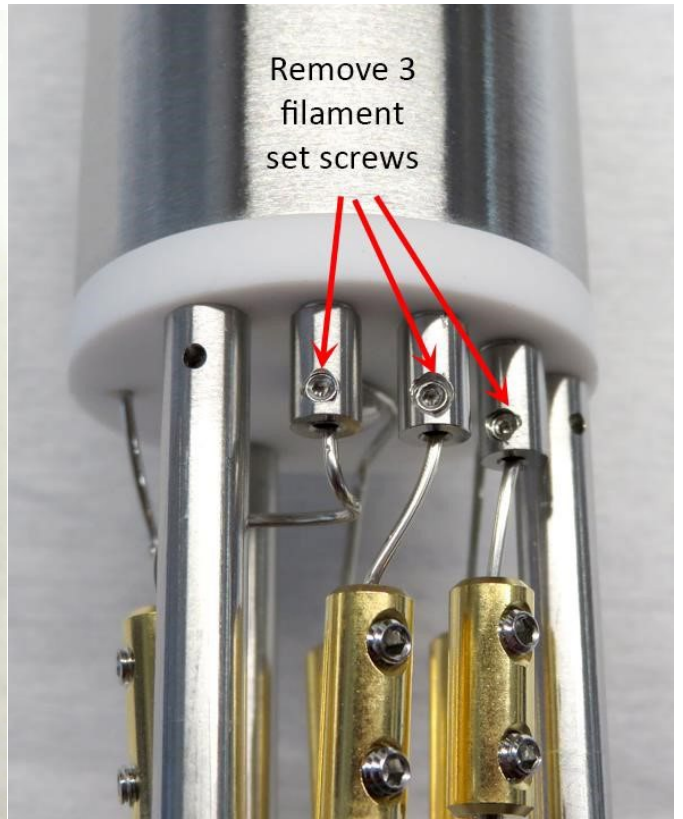
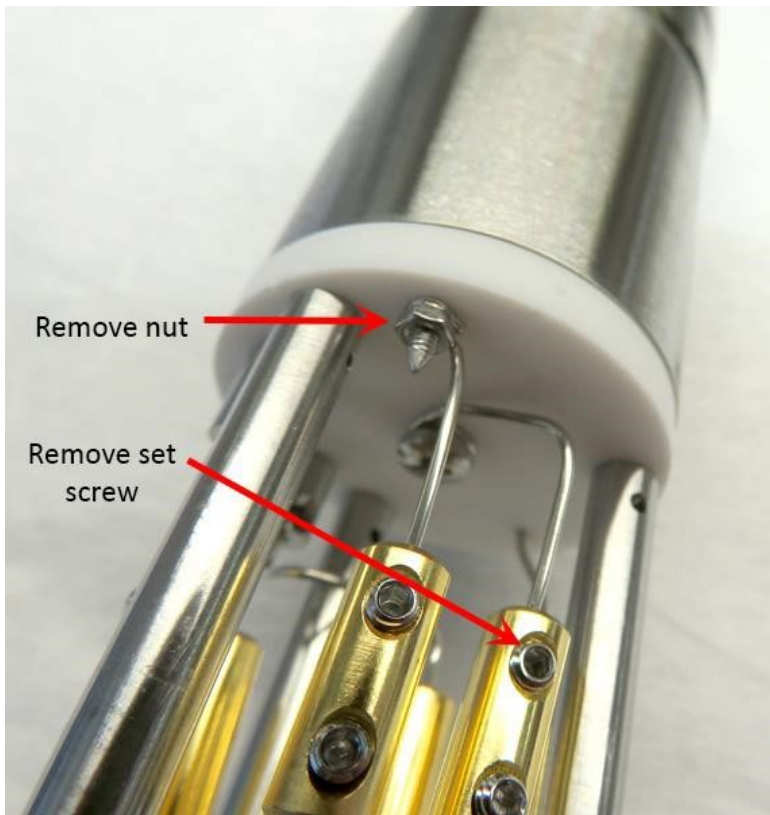
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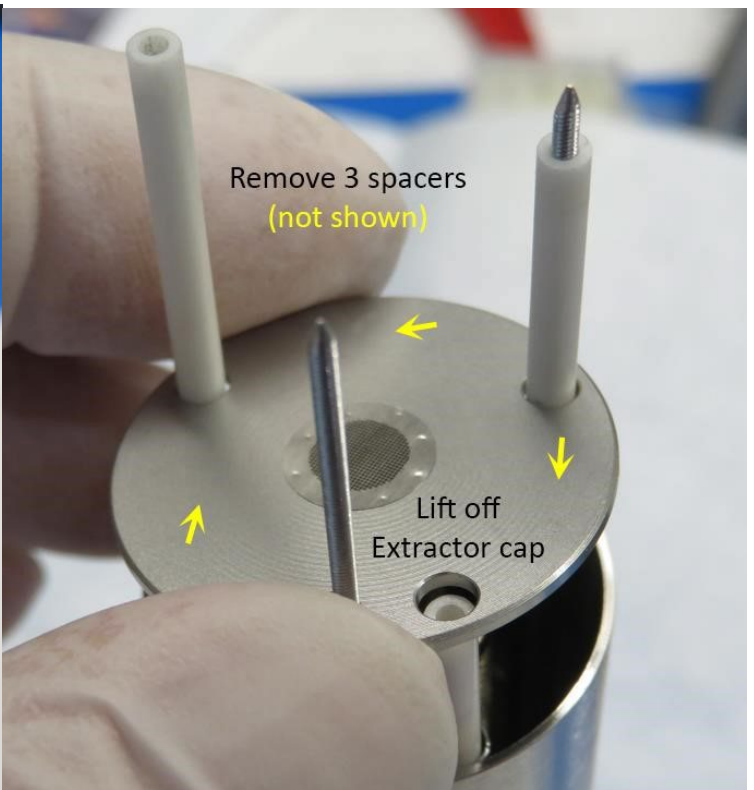
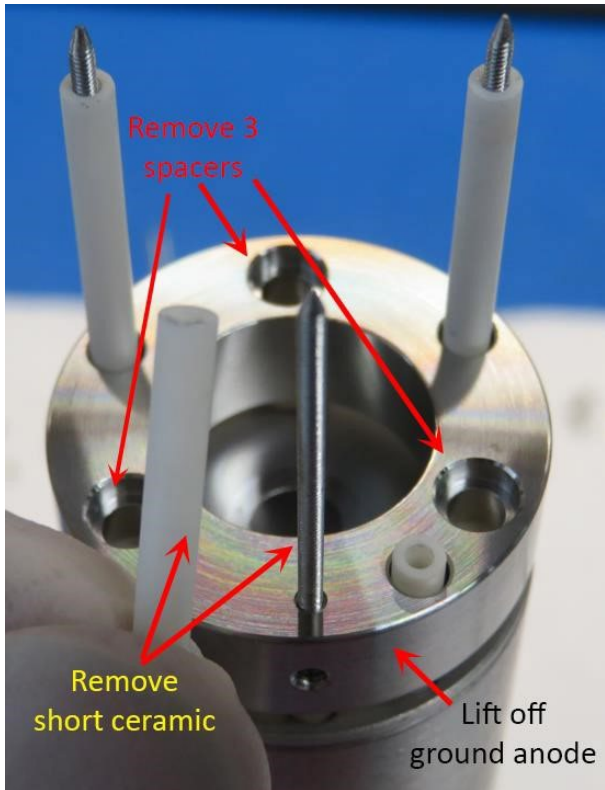
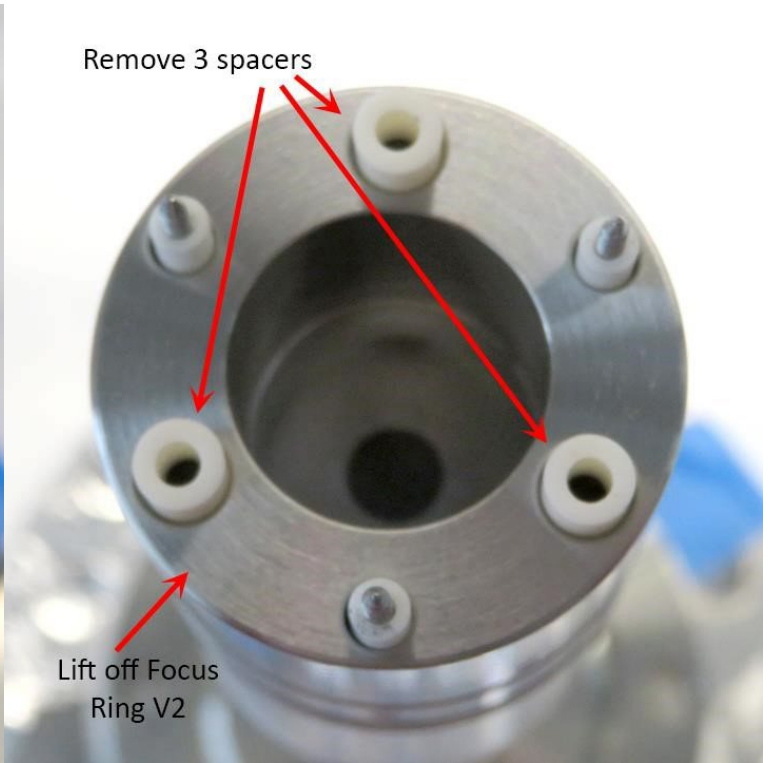
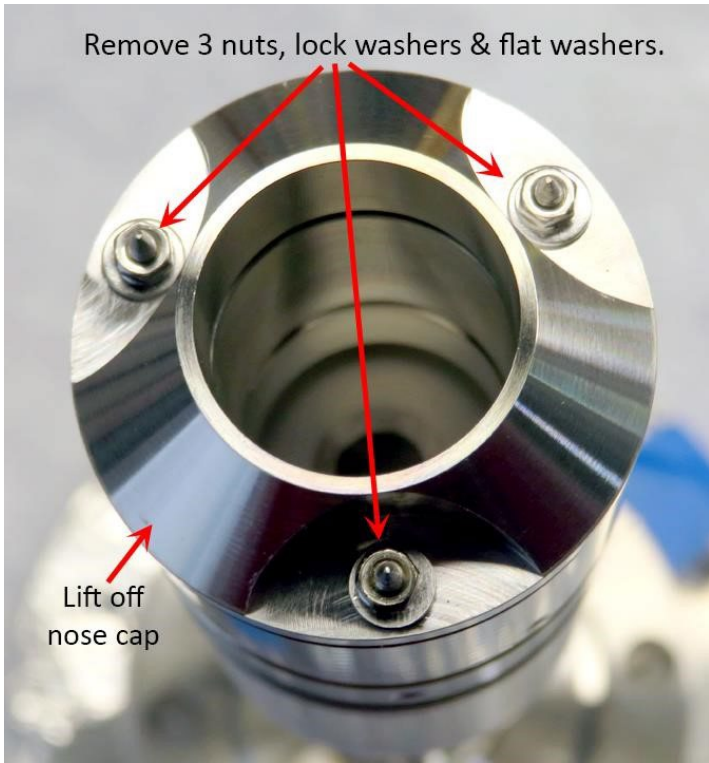
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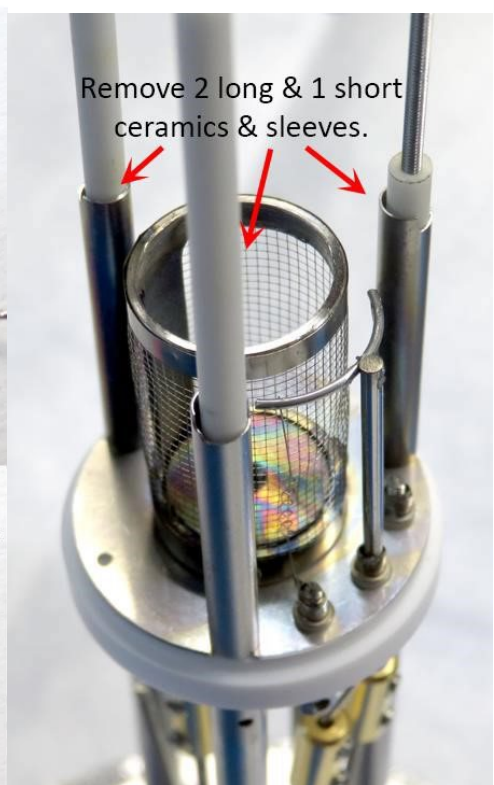
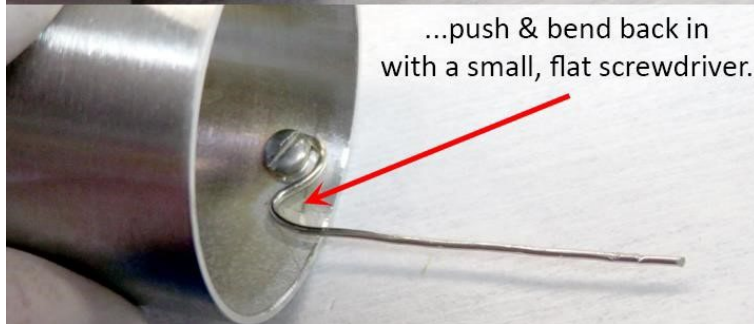
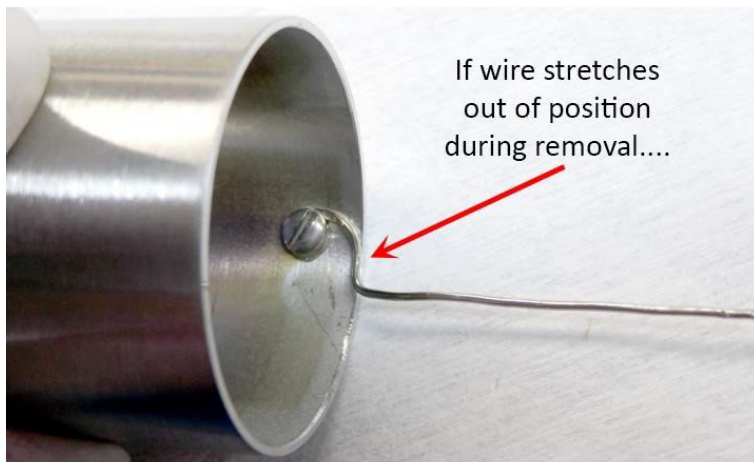
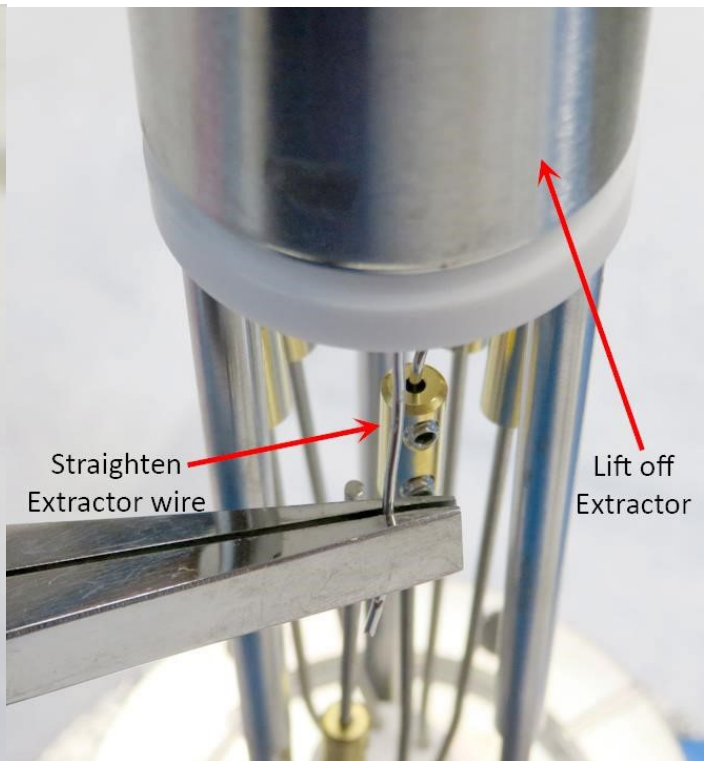
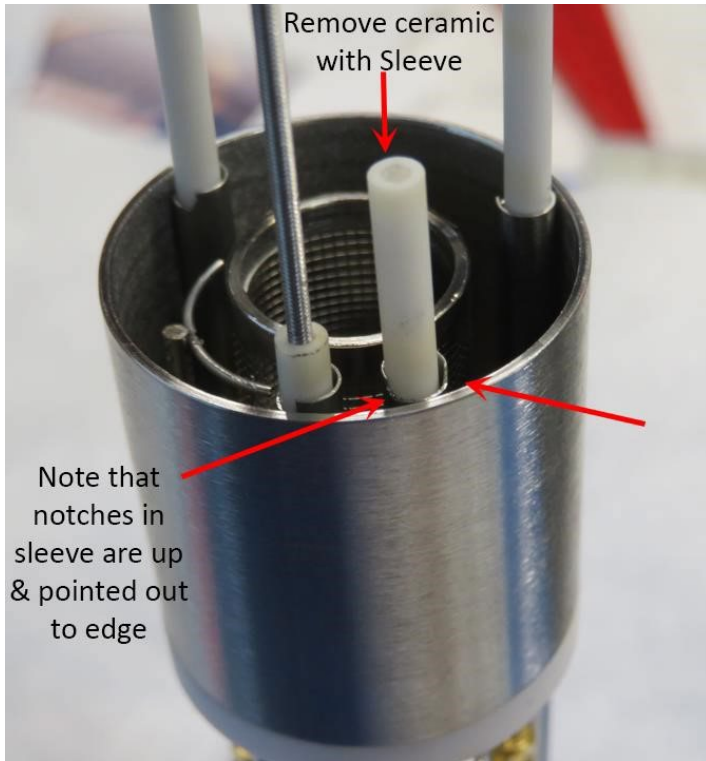
*\*Note: All couplers & set screws indicated may be completely removed if you find it easier to do so. Twisting the BE-copper couplers will help with removal from the feedthrough wires. BE-Copper coupler set screws are 2 lengths. Long on top, shorter ones to the bottom. All Couplers should stay within the circumference of the Source.*

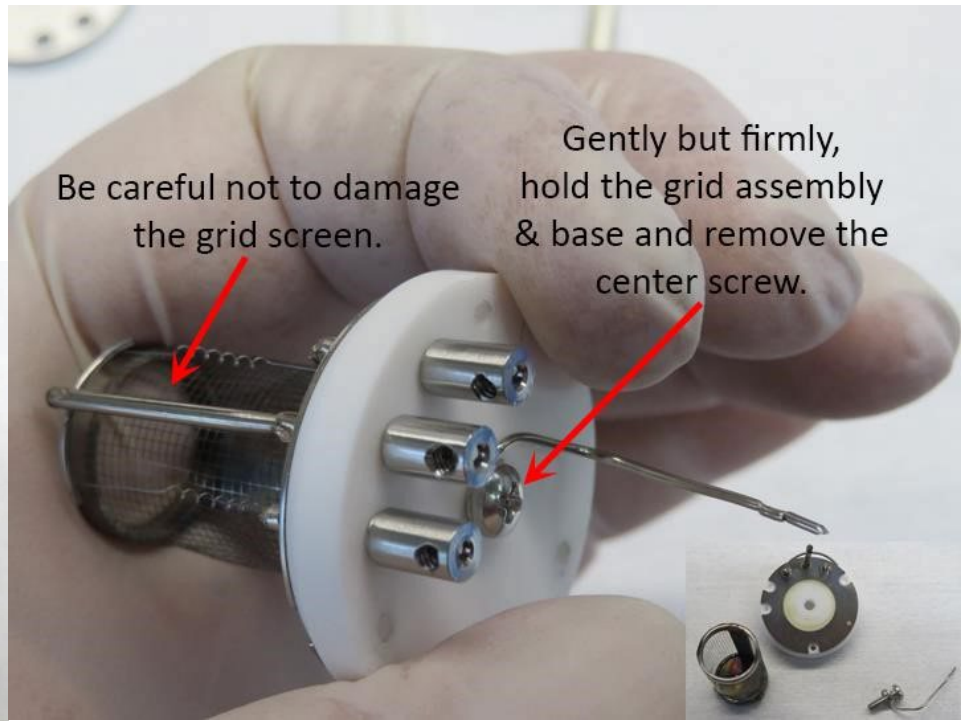
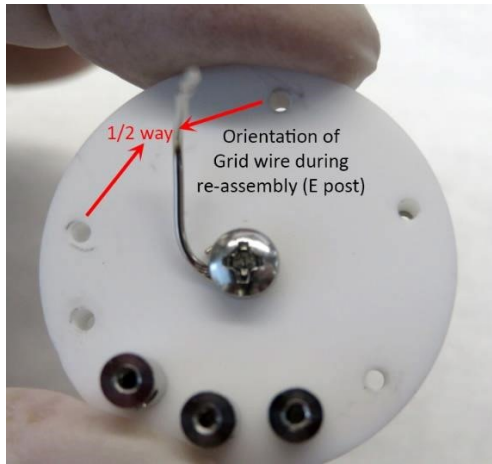
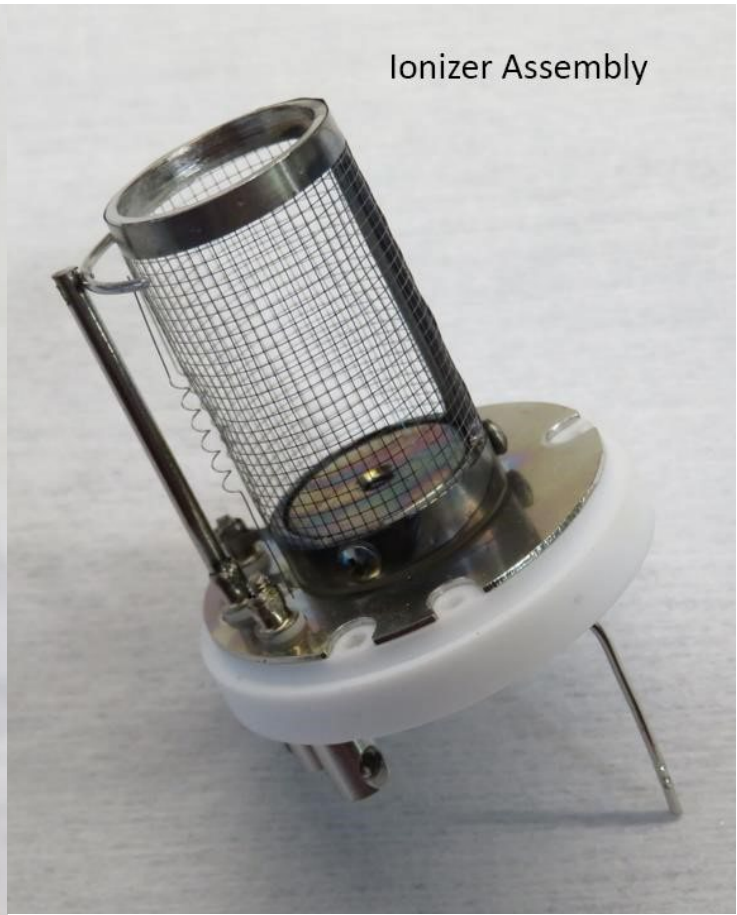
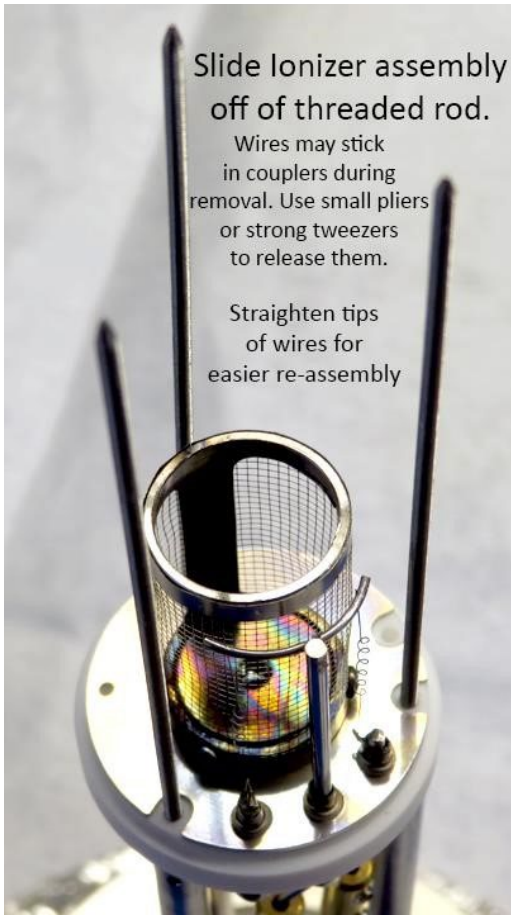


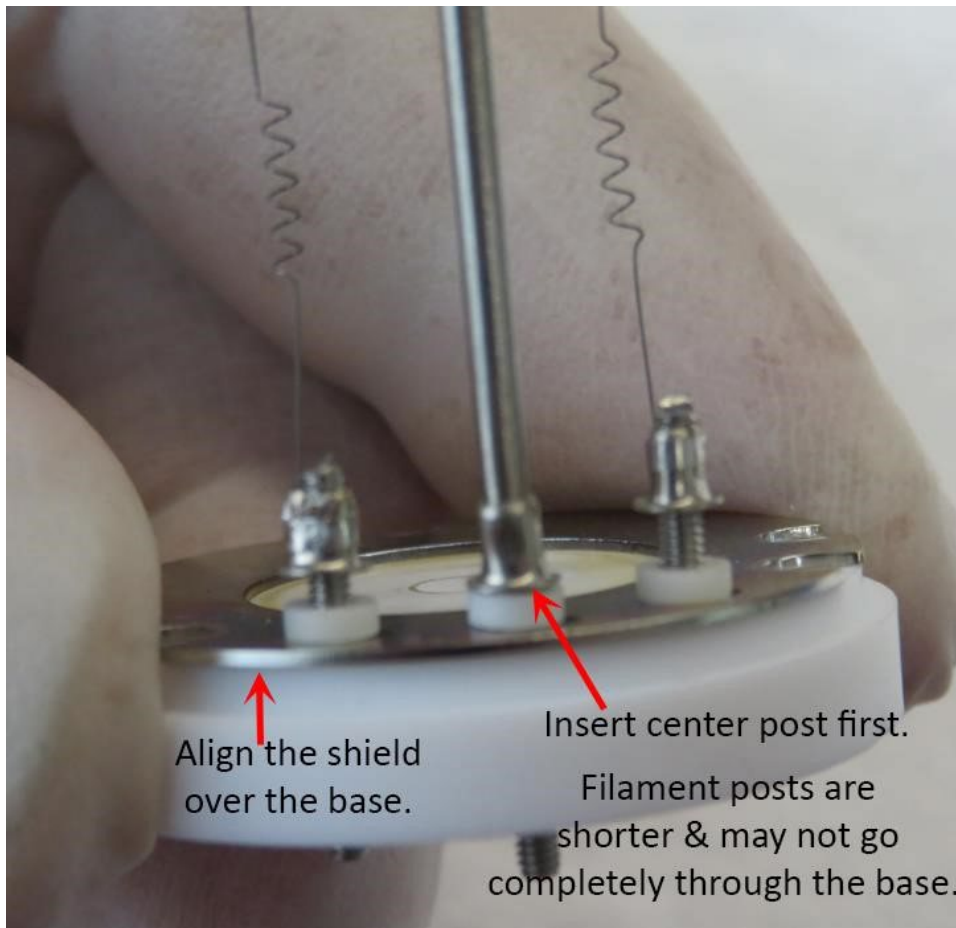
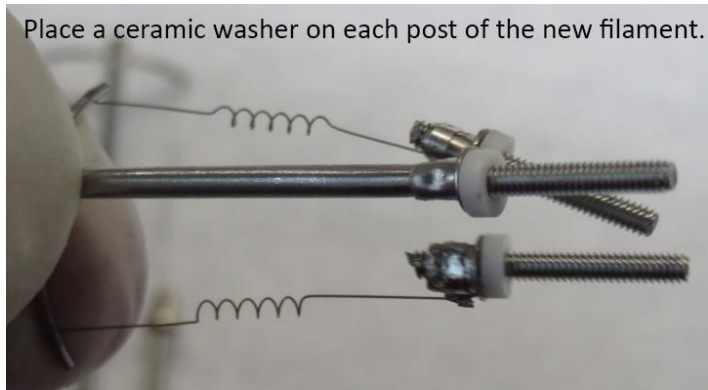
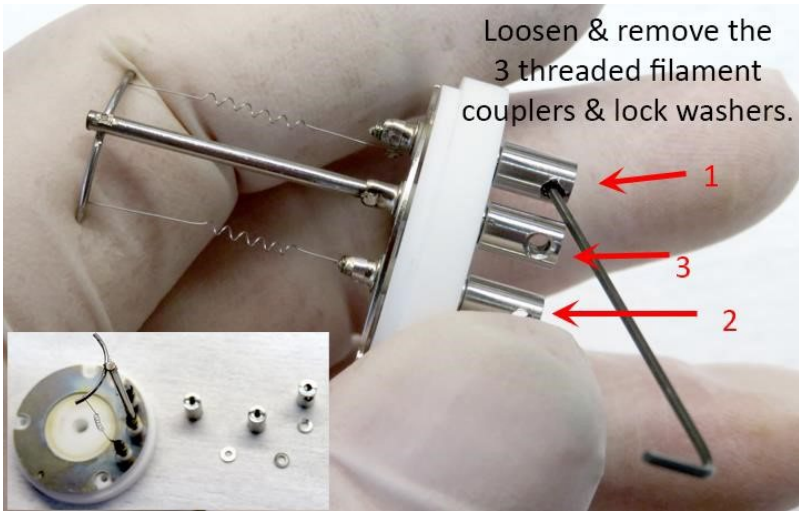














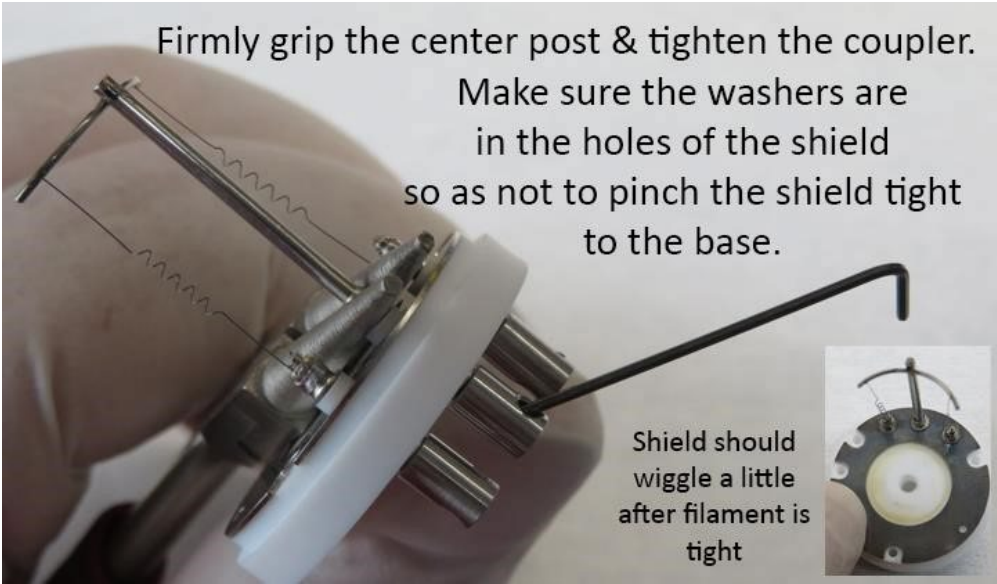


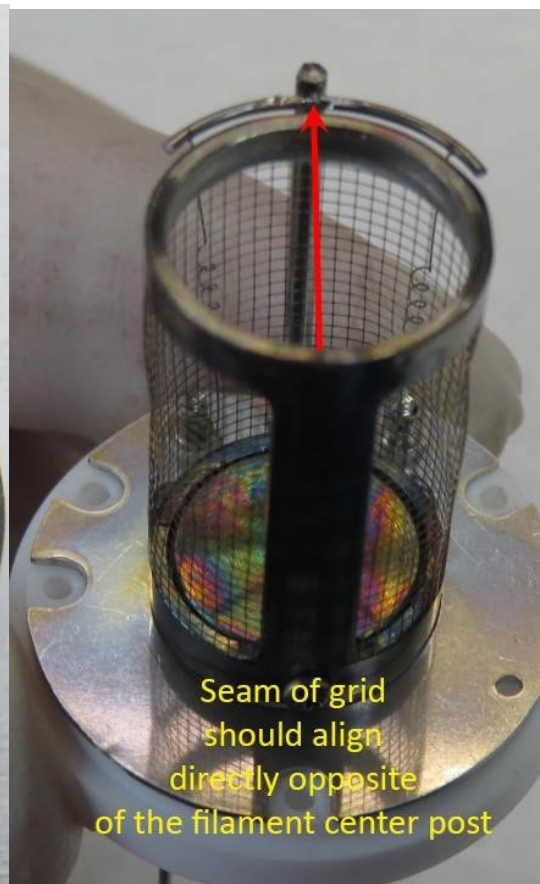
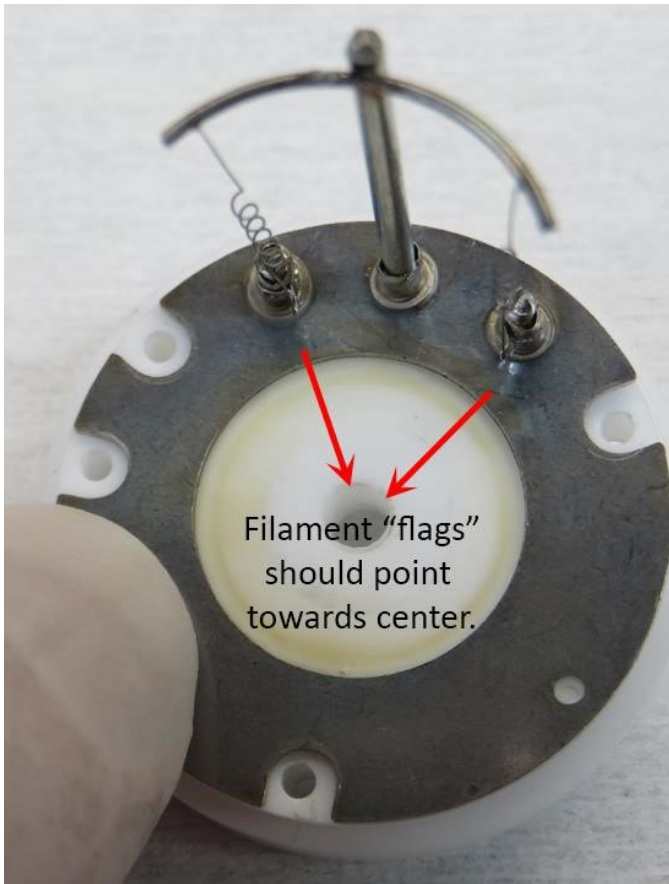
Lightly screw on coupler with lock washer to center post.

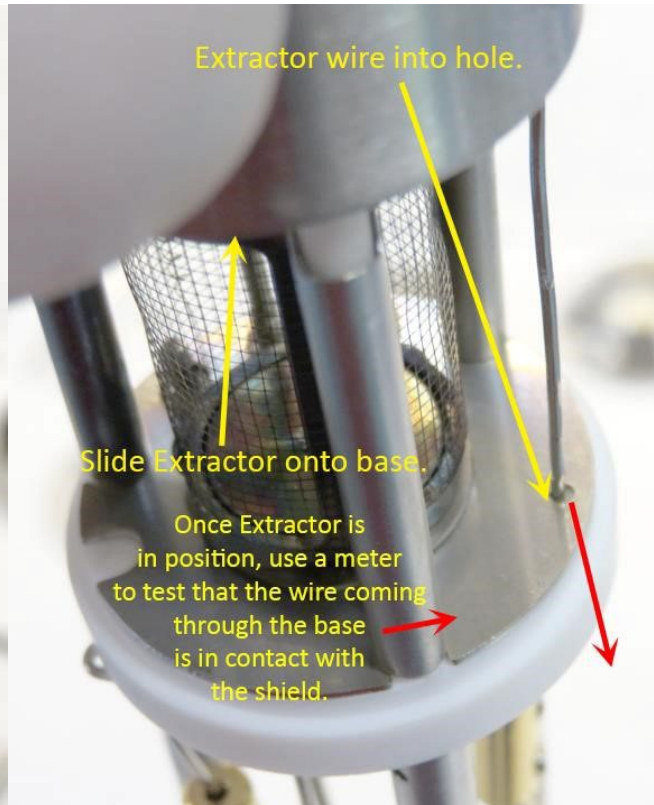
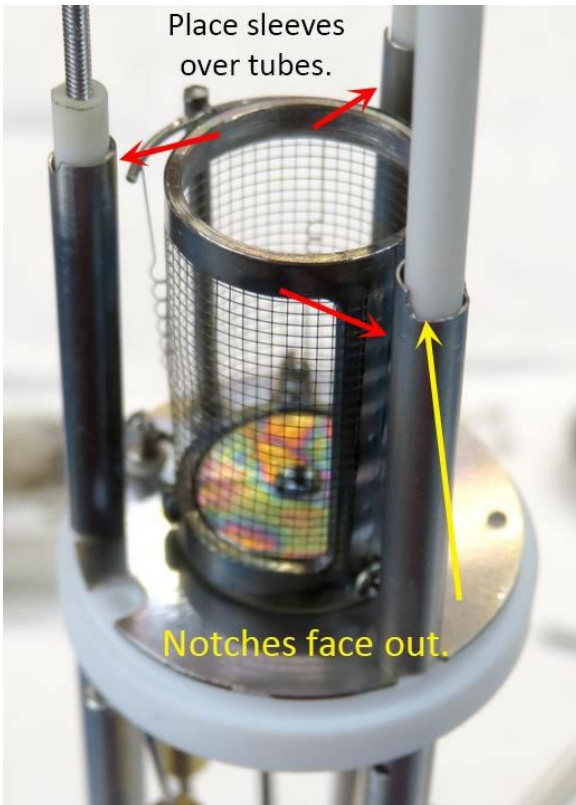
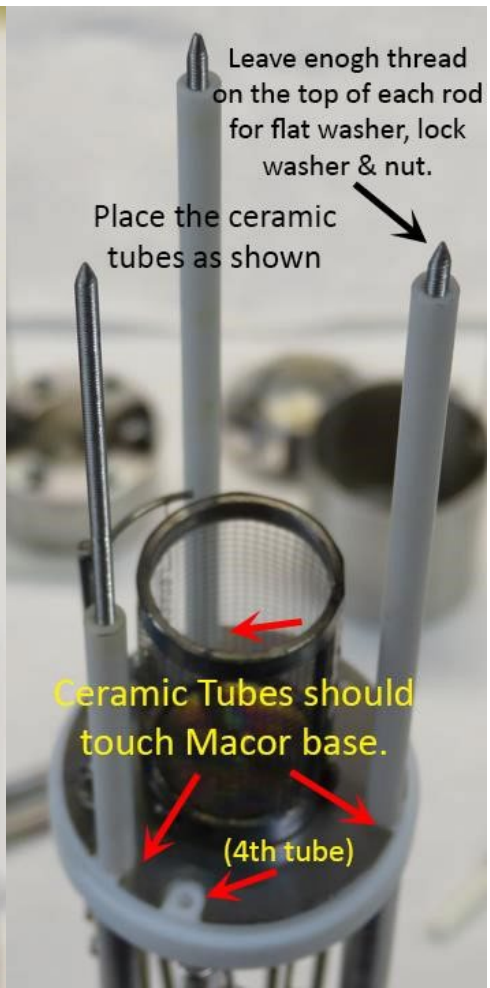
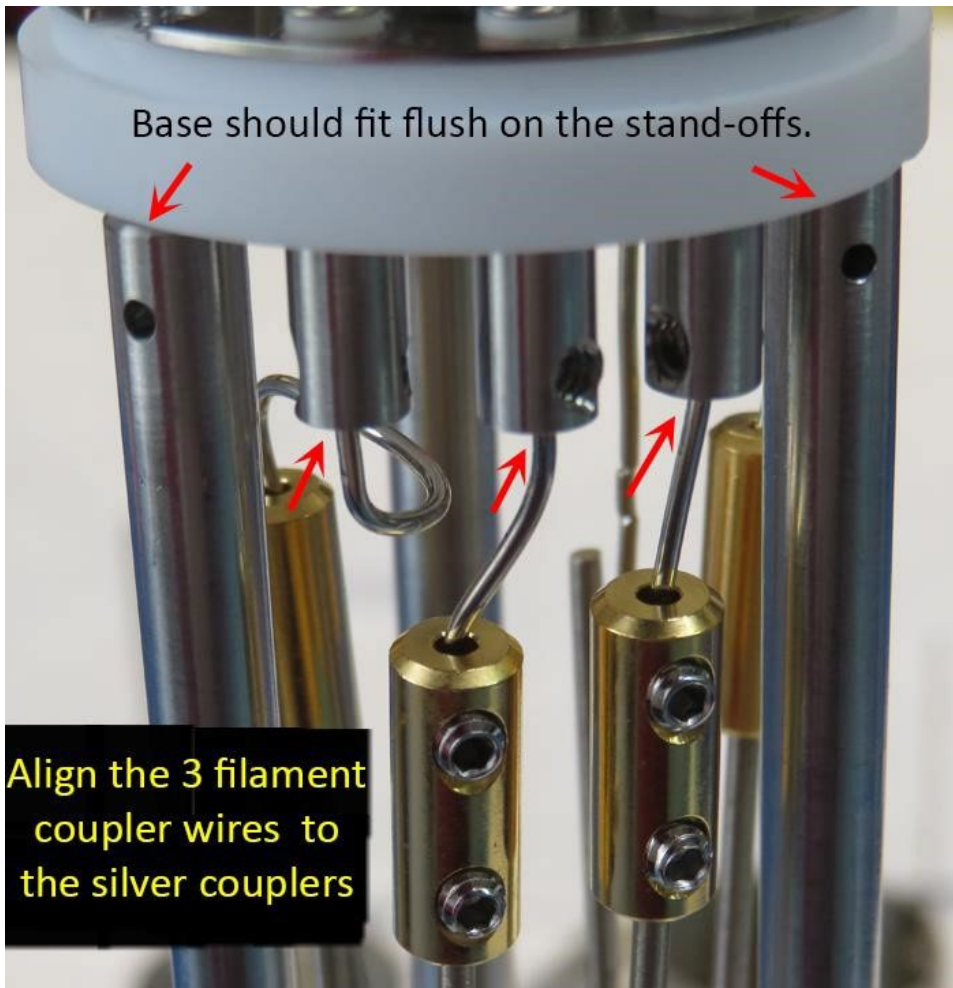


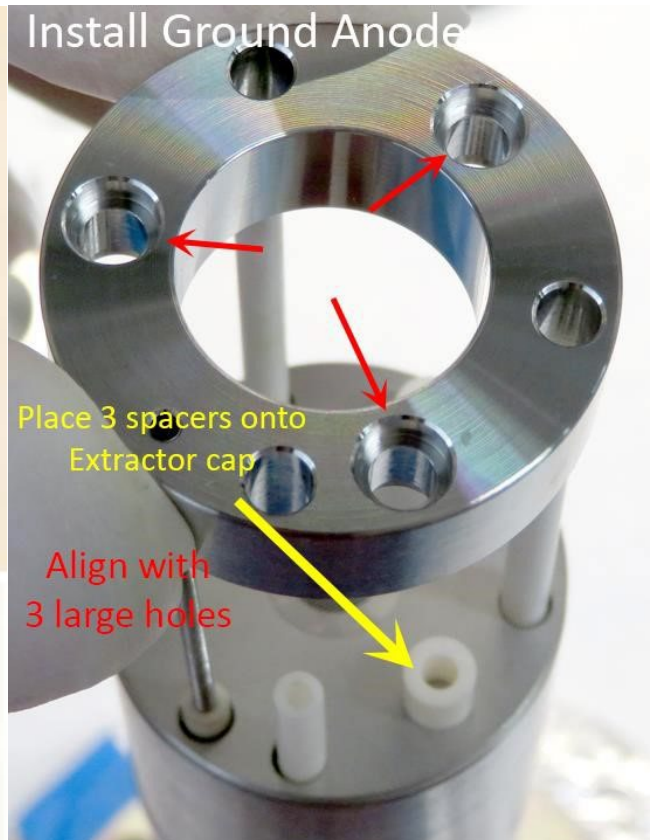
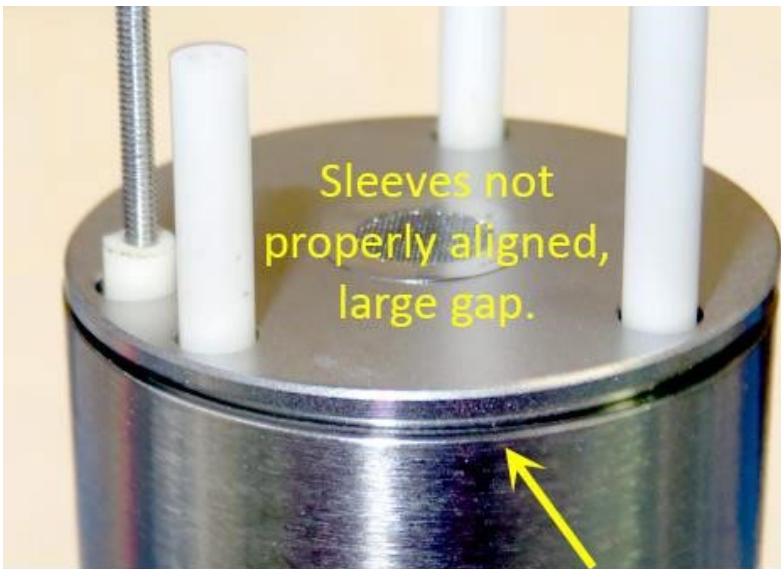
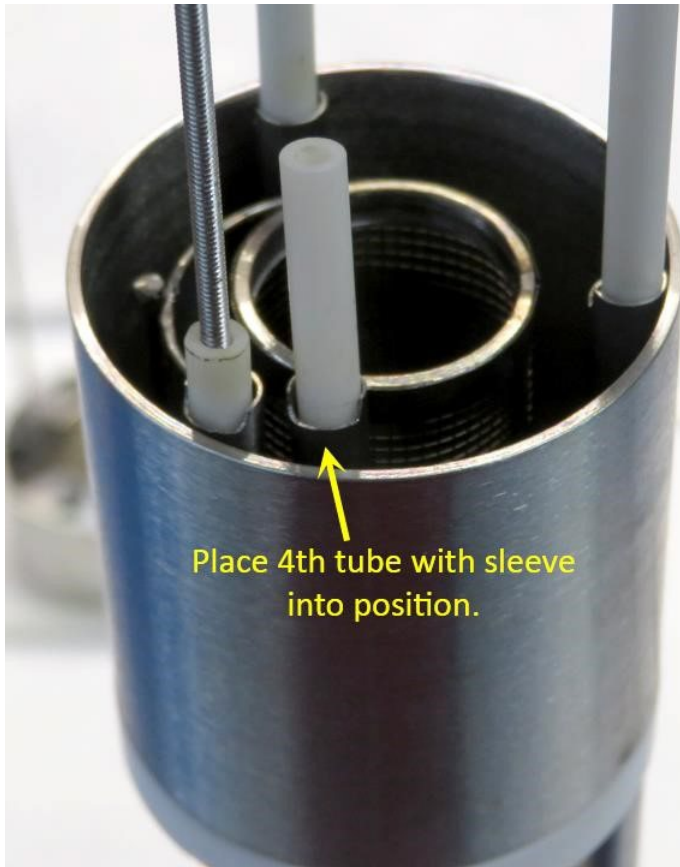
**There will be tension from the filament wire.**

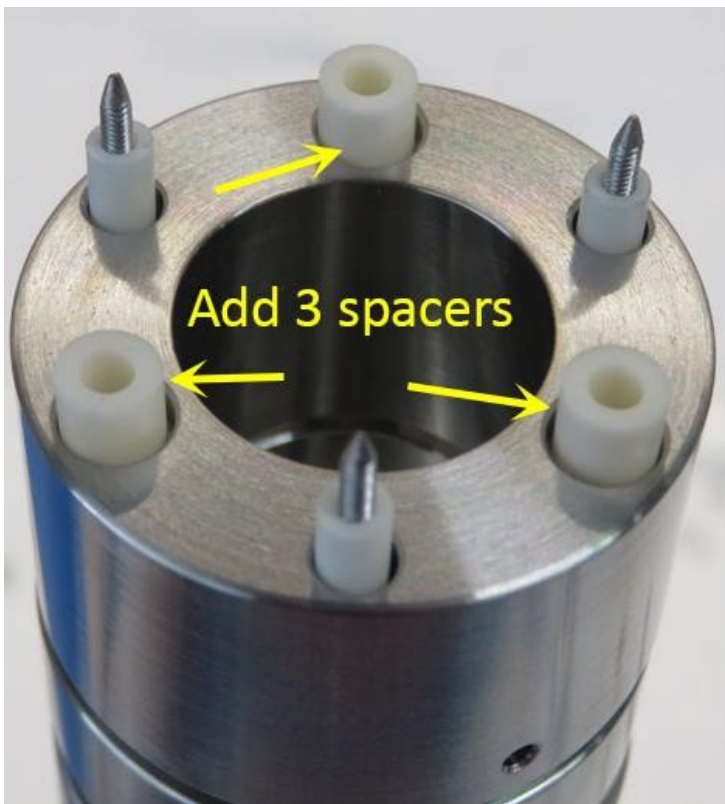
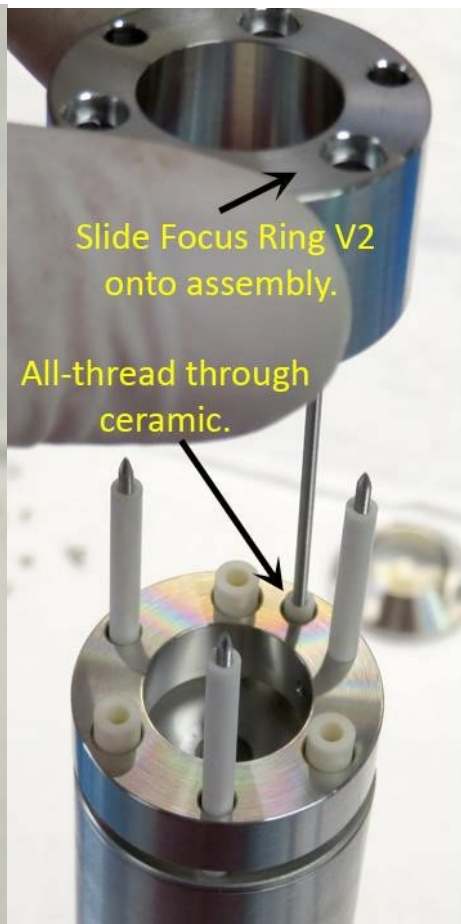
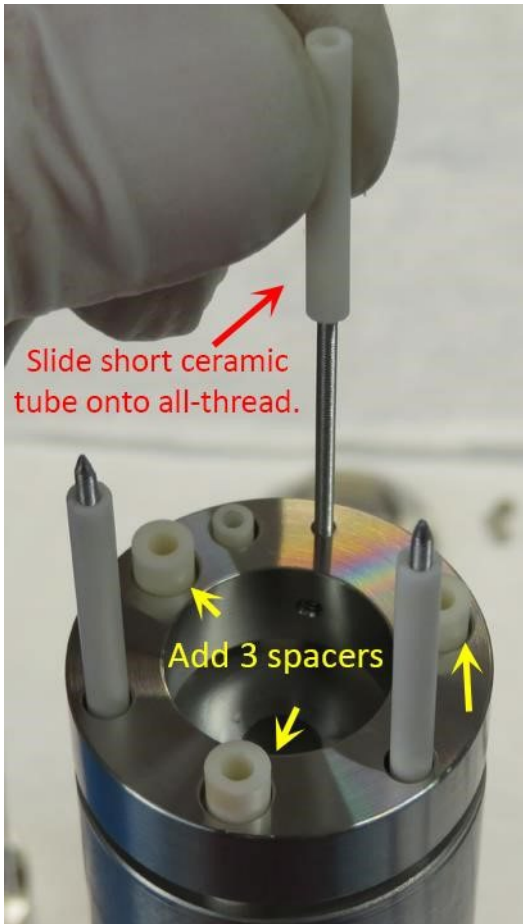
Carefully pinch down on the side cap of the filament posts & lightly screw on coupler with lock washer.

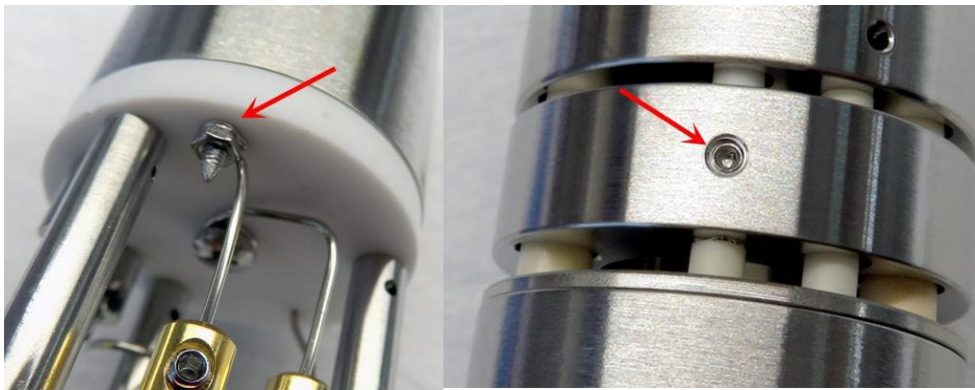
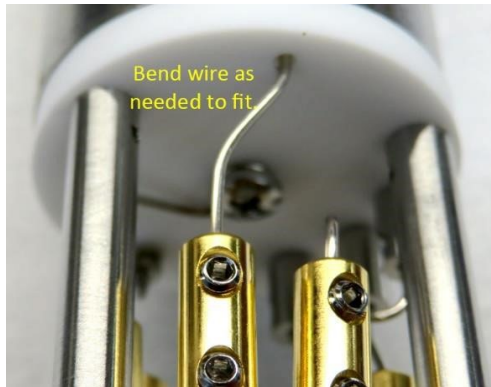












Install remaining hardware

**Congratulations, you are now ready for the Outgas Procedure**

## Out-gassing of the 04-165 Ion Source

IG2 packages and 04-165 Ion Sources newly purchased from RBD have had initial outgassing procedure performed. If the 04-165 Ion Source is up-to-air for an extended period of time after initial outgassing, follow the outgassing procedure, noting that wait times may be reduced by 50%.

Instructions are different depending on whether you are using the 32-165 or 32-175 control.

**NOTE: Before outgassing the 04-165 ion source the vacuum chamber needs to be baked out to remove water vapor from the ion source.**

### Using the 32-175 Control

***If at any time during out-gassing the emission meter starts to climb rapidly, turn the Emission Potentiometer down until the emission current stabilizes. Then resume the procedure.***

1. With the 32-175 main power switch OFF, make sure that the Emission Potentiometer is fully CCW. The Emission Potentiometer controls the filament current. 0 to 10 turns correspond to 0 to 2.0 amps of filament current.
2. Set the Beam Voltage Knob to 500 V and the Beam Voltage Switch to OFF.
3. Turn the 32-175 main power switch ON.
4. Slowly turn the Emission Potentiometer CW typically 6 to 7 turns until you have 1 to 2 mA of emission current. Keep turning the potentiometer until the emission activates. ***Watch the meter – if it spikes, turn down immediately until you are back between 1 and 2 mA.***
5. Wait for 10 to 20 minutes then turn the Emission Potentiometer CW until you have 5 mA of emission current.
6. Wait 10 to 20 minutes and then increase the Emission Potentiometer until you have 10 mA of emission current.
7. Repeat this process in increments of 5 mA until you have 25 mA of emission current.
8. With the emission current still at 25 mA and the Beam voltage set to 500 V, turn the beam voltage ON.
9. Wait 5 minutes and then turn the beam voltage to 1000V.
10. Wait 5 minutes and turn the beam voltage to 1500V.
11. Wait 5 minutes and turn the beam voltage to 2000V.



12. Turn the beam voltage OFF.
13. Turn the emission current knob fully CCW.
14. Repeat steps 2-13 for filament F2.
15. Turn off the 32-175 main power.

**The 32-175 and 04-165 ion source are now ready to operate using filament F1 or F2.**

### **Using the 32-165 Control**

1. Connect multi-meter to Filament Adjust banana jacks and set range to DC volts.
2. Turn power on. Verify green LED turns on and yellow LED turns off.
3. Set Beam Voltage Select dial to 500.
4. Turn **Focus** Adjust dial to 4 .
5. Flip the beam control switch up to Manual position. Yellow LED should turn on.
6. Note the vacuum reading on your Ion Gauge.
7. Slowly turn Filament Adjust Control clockwise until meter reads .5V (.5A filament current). Turn filament current up in 1/10th (.10) increments with a 5-10 second pause at each point until current reads 1.5V. **Watch for sudden bursts of outgassing (usually between 1.3 & 1.5A). If this should occur, turn down current and slowly work your way back up.** Allow filament to glow for approximately 30 seconds and reduce filament current to 1.4V for 15 minutes and then reduce current to 1.3V
8. Allow filament to outgas for approximately one hour total or until the reading on your Ion Gauge returns to, or near to the level in step 6.
9. Slowly turn filament current up to 1.5V and outgas for 15 seconds. **If sudden bursts occur at lower voltages, take your time reaching 1.5V to prevent the filament from warping out of position.**
10. Slowly turn the Filament Adjust Control counter-clockwise back to zero.
11. Flip the beam control switch down to Timer position.
12. Set back panel Filament Select Switch to F2 position. (Second filament conditioned often takes less time).
13. Repeat steps 5-14.

**The 32-165 and 04-165 ion source are now ready to operate using filament F1 or F2.**