



AMS Hardware Updates, Tips and Tricks

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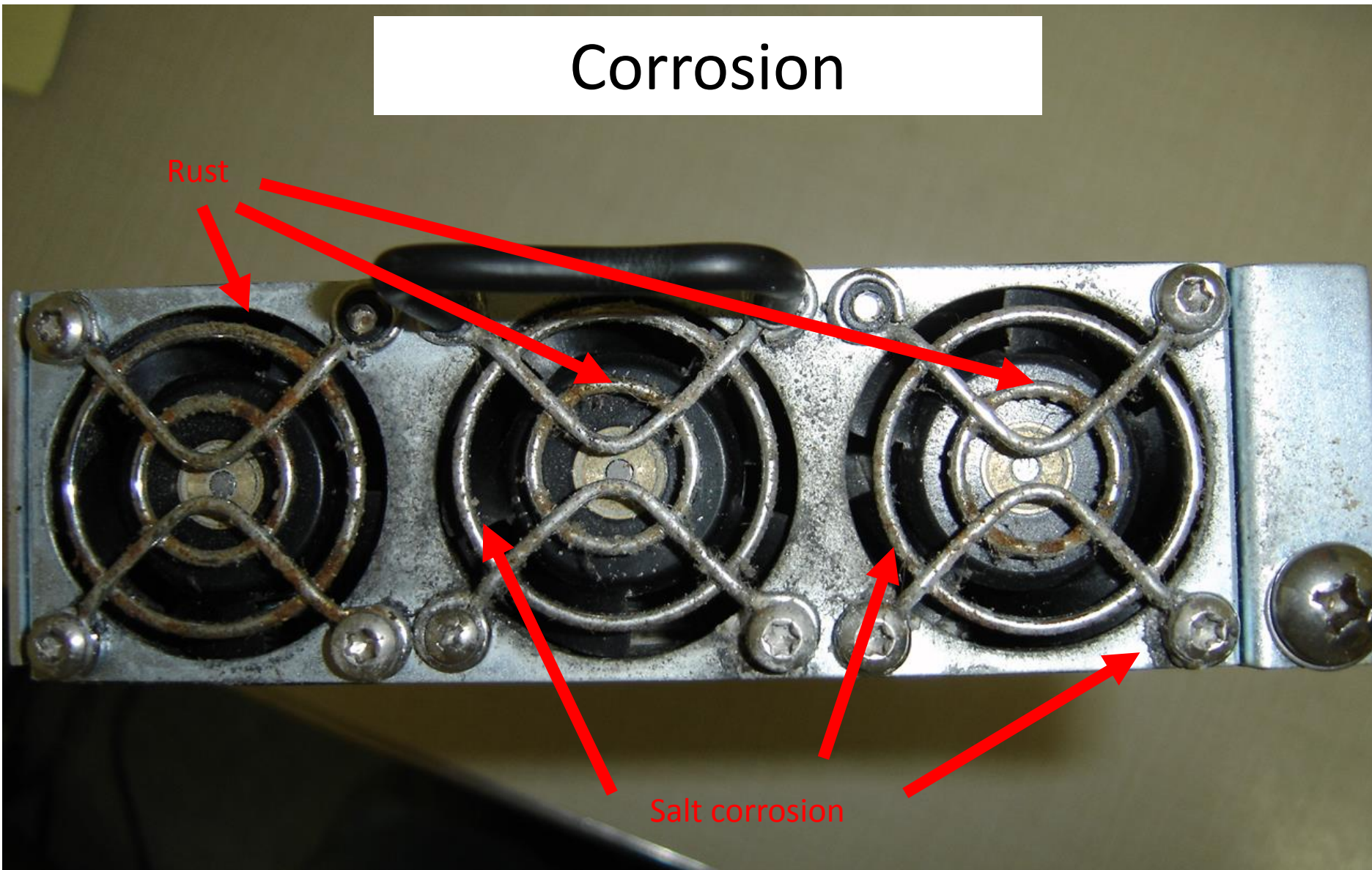
AMS Maintenance Tips

- Clean vacuum chamber surface
- Check for loose/missing connections/fasteners
- Check for stressed cables
- Always monitor pump performance
- Always monitor MD1/Lens pressures (load/no load)
- Clean cooling fan filters
- Dirt inside computer
- “*Dirt*” on computer HD (clean up and defrag)

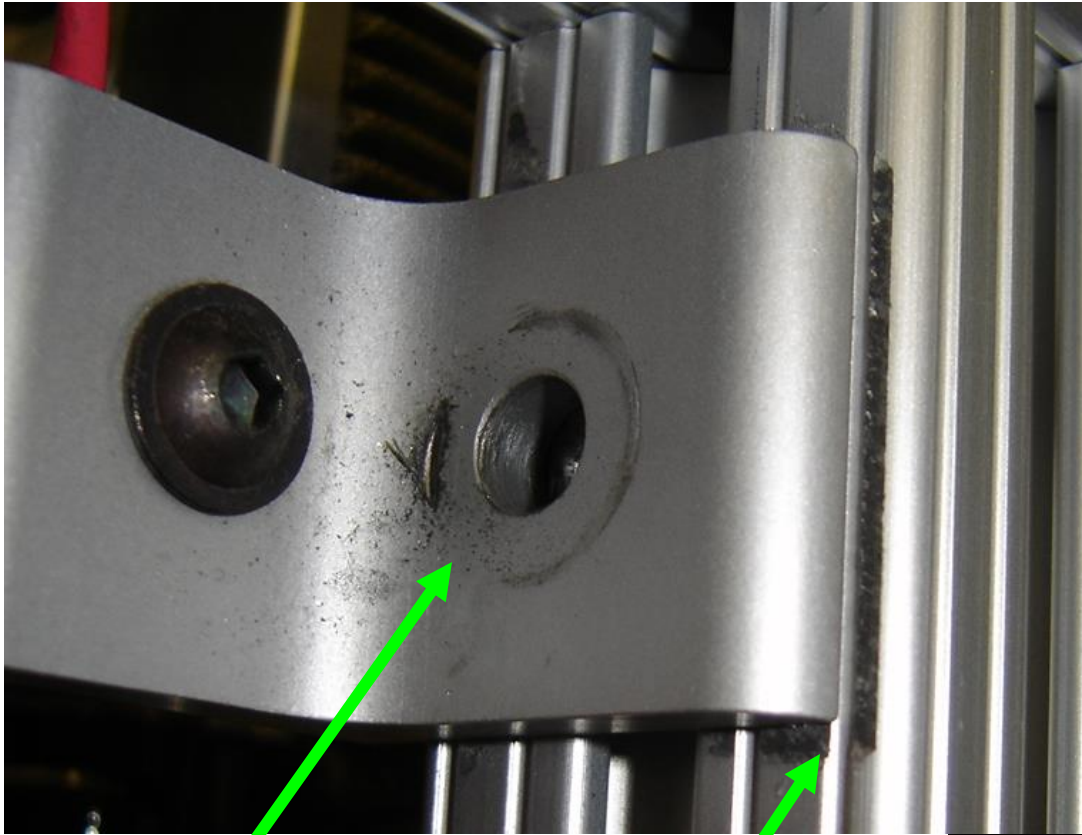
Corrosion

Rust

Salt corrosion

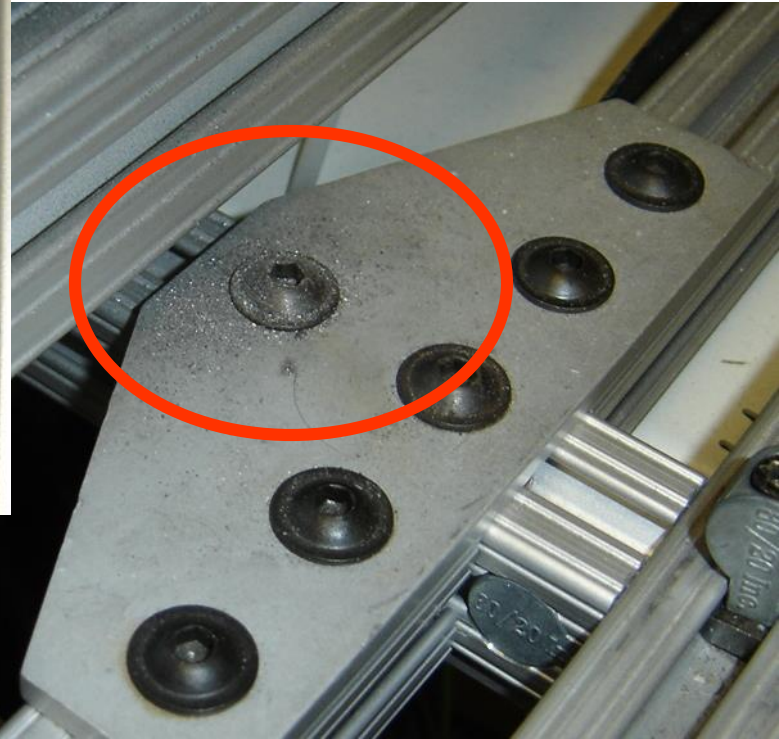


Missing fasteners



Missing fastener, chaffing metal

Aluminum dust



Dust Removal



Dust and Electronics are mortal enemies!

Inspect Shipping Container



Fork Lift Damage



Don't leave instrument in the shipping container

A Case Of Extreme Shipping Damage



Lesson: This really shows how hard your instrument could be jerked around in transport. Be careful when selecting transport. This crate was knocked over in transport.

Typical Pressures (Torr)

	No Load	Load
MD1	~1.5	~4.0
Lens	~0.00	~1.3

Know what they are on your specific AMS,
so you can note any changes.



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What are the operating currents for all pumps?

	Gas Load Off (mA)	Gas Load On (mA)	Delta T* (Degrees C) (Closed/Open)
P2	~ 450	~ 850	9/13.3
P3	~ 250	~ 300	9/9.3
P4	~ 200	~ 250	6/5.9
P5	< 200	< 200	6.2/6.5
P6	~ 200	~ 200	9.6/9.6

*Delta T = Pump Temp – Ambient Temp

Record Pump Data with Pump Control Software

Pump Speeds

	Speed (Hz)
P2	963
P3	1250
P4	1100
P5	963
P6	1150

The current and/or temperature of Pump “X” has recently increased. I think it may fail soon, is there something I can do?

- One may be able to exchange the pump before it actually fails. Hopefully you have been recording pump data before and after the current/temp change. Having the data showing the changes of the pump characteristics makes it easier to prove to Agilent that an exchange is necessary.

A pump failed on my AMS, what is the best way to store the instrument until I can obtain an exchange pump?

- Close the inlet valve, and let the MD1 diaphragm pump evacuate the chamber.

Doing this, at least you will know that the chamber is ~2 Torr, which should save the MCP.

I am bringing my AMS to a location where I expect frequent power outages, what can I do to protect the AMS?

- Make sure that all interlocks are functioning as they should. See interlock troubleshooting power point.
- Use a UPS. [Interlock Description & Troubleshooting.ppt](#)
- Consider automatic inlet option?

Interlock Explanation

- Master Interlock
 - Software Interlock
 - Polls all pumps
 - If any pump has an error, shuts down all pumps
- Ionizer Interlock
 - P5 falls below 90% of full rotational speed
 - Red LED on TPS, shuts off High Voltages
- Vaporizer Interlock
 - P4 and/or P6 fall below 90% of full rotational speed
 - Heater LED and Heater Power LCD on EB shut off
 - Shuts off power to Vaporizer

Leak Checking Tricks



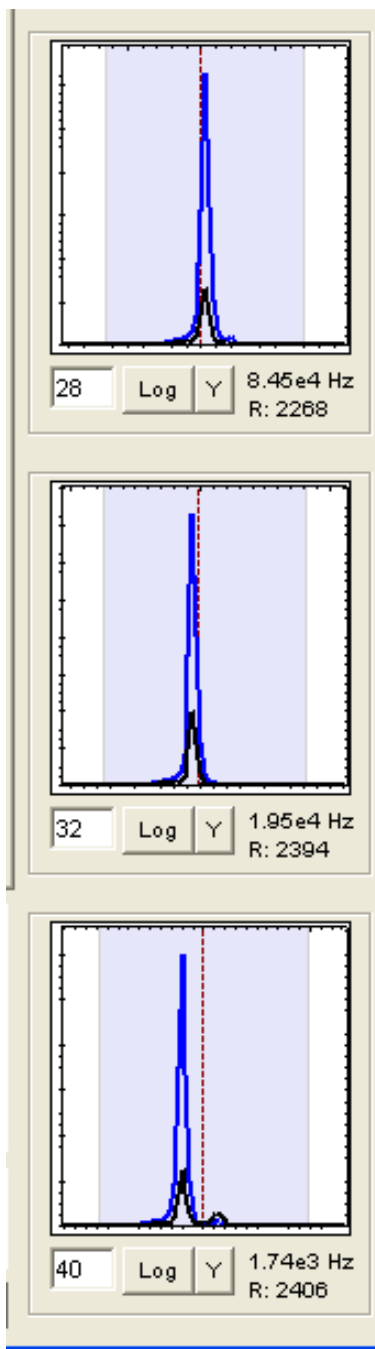
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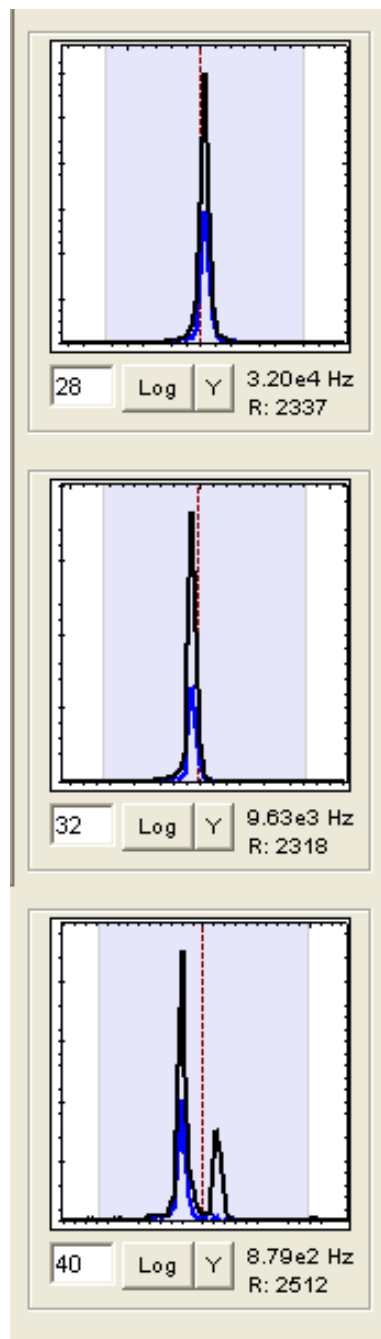


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Normal



Leak



If the Airbeam (m/z 28,32,40) has a diff/closed ratio of < 2 you probably have a leak.

Note: Incorrect chopper servo alignment can also cause these symptoms.



determine where leak is by examining magnitude of signal

If the leak is in the PToF region, the **difference** Airbeam will be attenuated and the **closed** AB will not be changed too much from normal.

If it's in the detection region, the **difference** AB will be about the same as normal, but the **closed** air signal will have an elevated background.

Using ToF as Leak Checker



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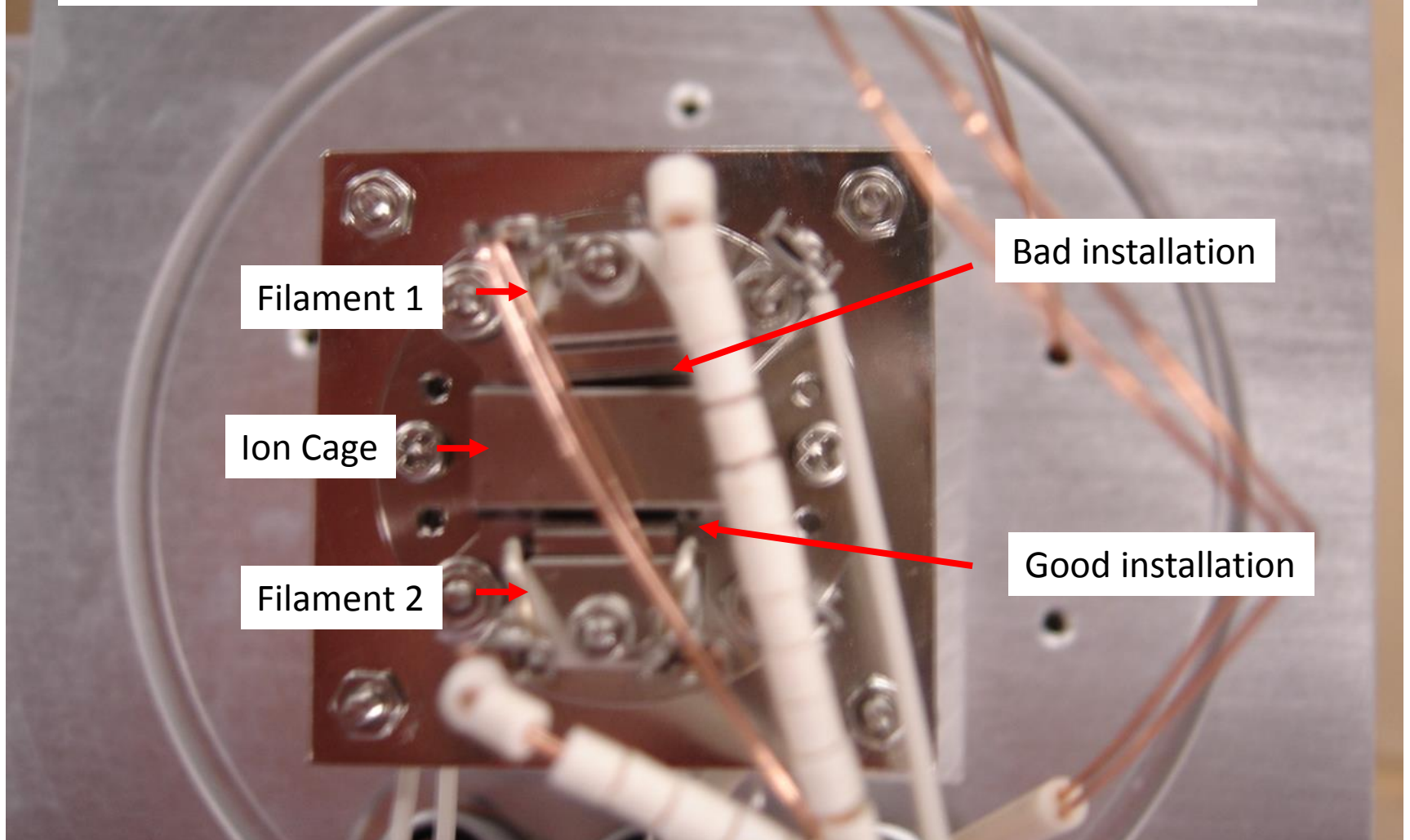
- He or Ar are good choices.
- Using He may require a change in the timing window.
- Use controlled bursts of gas, don't "flood" system.
- Depending on where the leak is, may need to wait several seconds for a response.



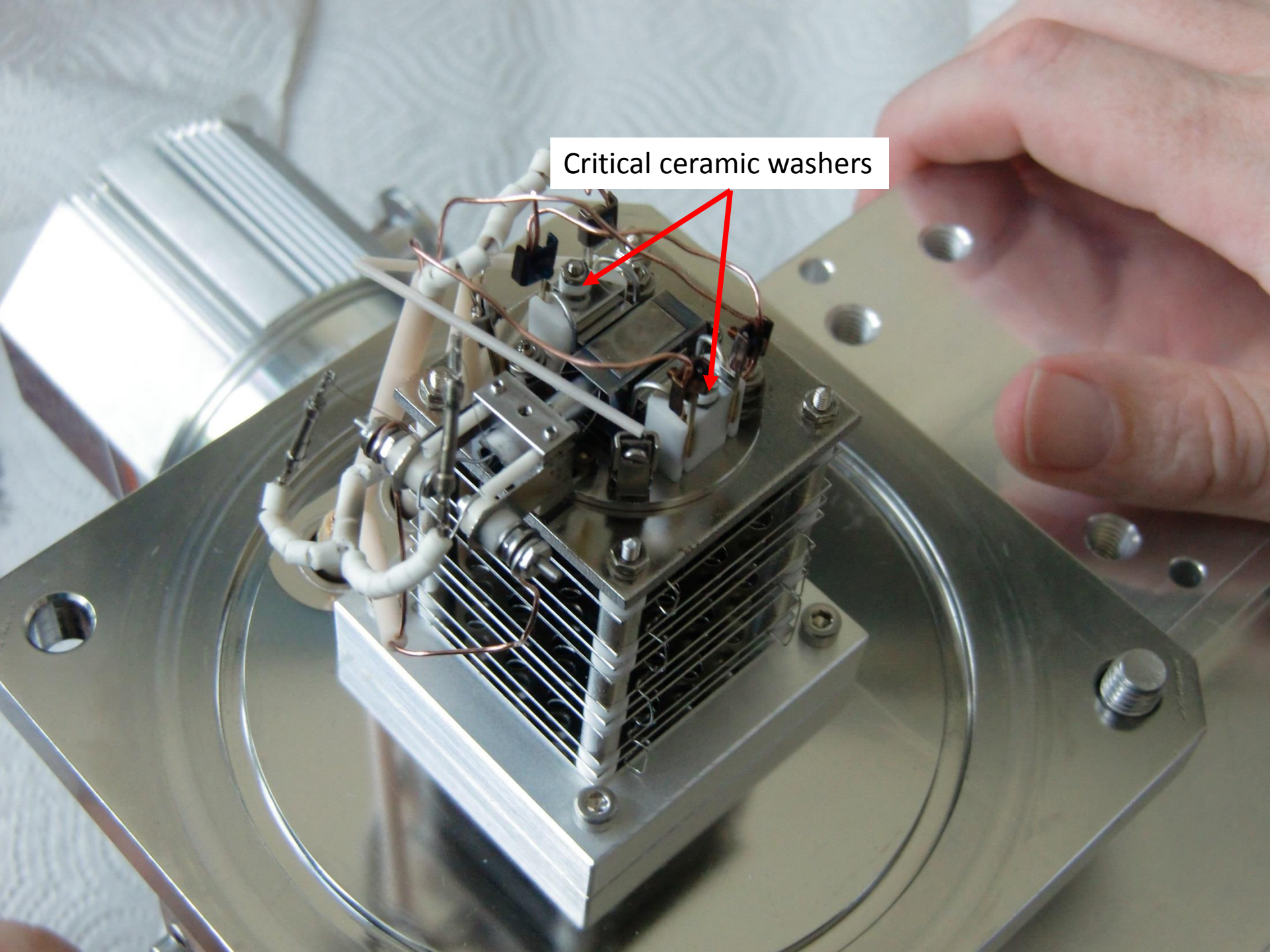
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Filament Installation

Install filaments such that they are as parallel as possible to the ion cage.
Be EXTRA careful when installing that nothing is shorting.
The ceramic washer is critical, as it isolates the filament from ground.

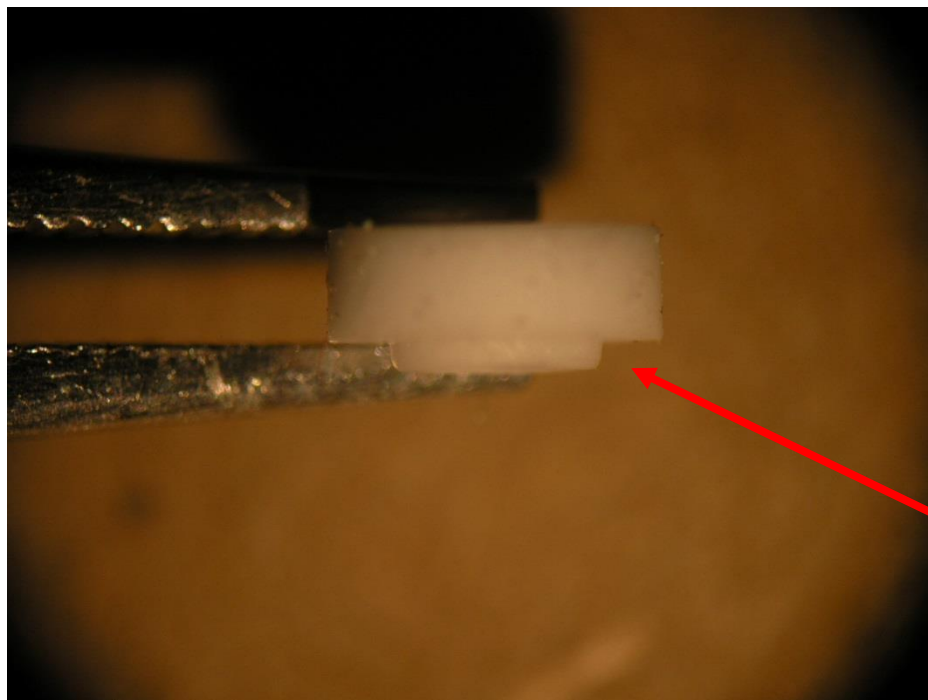
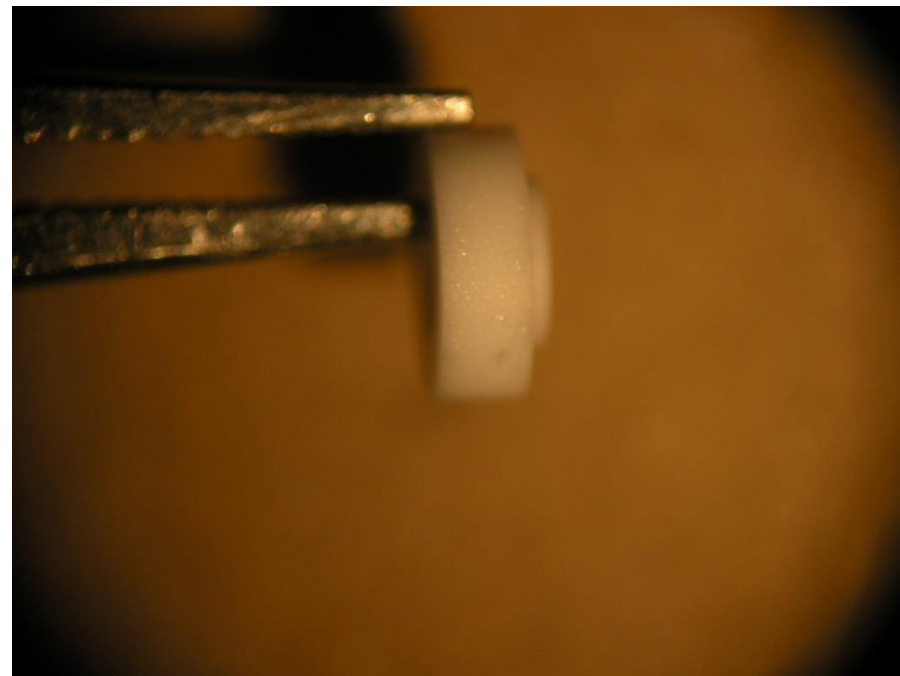
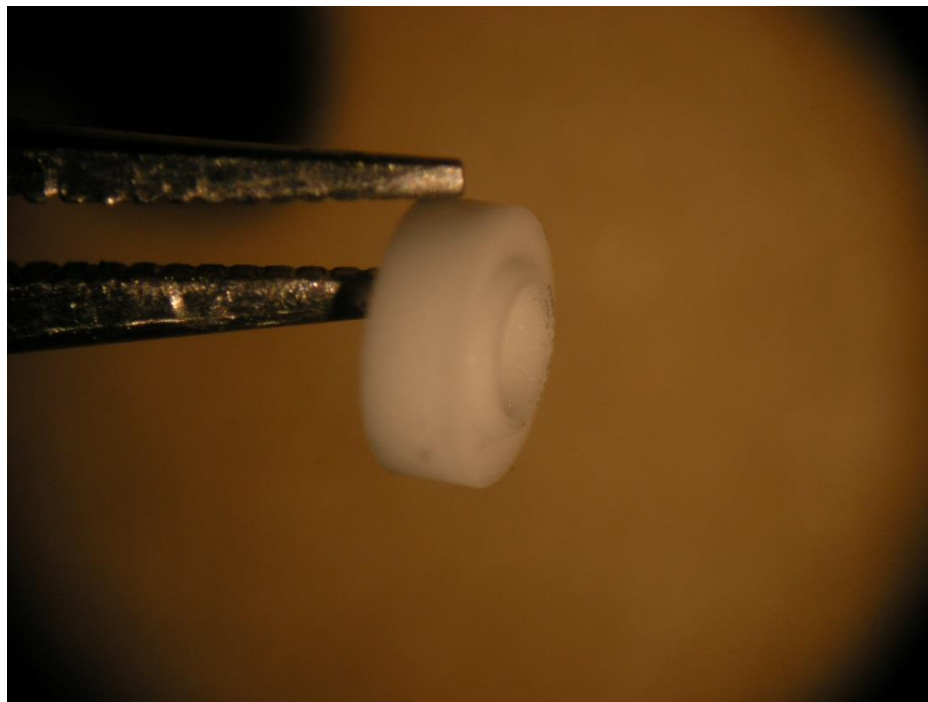


Critical ceramic washers





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This side down!

I replaced a filament, it turns on, but the emission current is different than before. Why?

- No two filaments are alike, and the new filament will need a different Filament Current to obtain the same emission current.
- When you turn on the filament, reduce the filament current to 0A, and bump it up a little at a time until you obtain the desired emission current.

Tuning Tip:

- Tune *both* Filaments **before** leaving for the field.
 - This can save time and possibly prevent one from having to vent while in the field. Also, sometimes a filament does not tune as well as one would like, so one may get a better tune with the second filament.

Vmode Bleed Through in Wmode



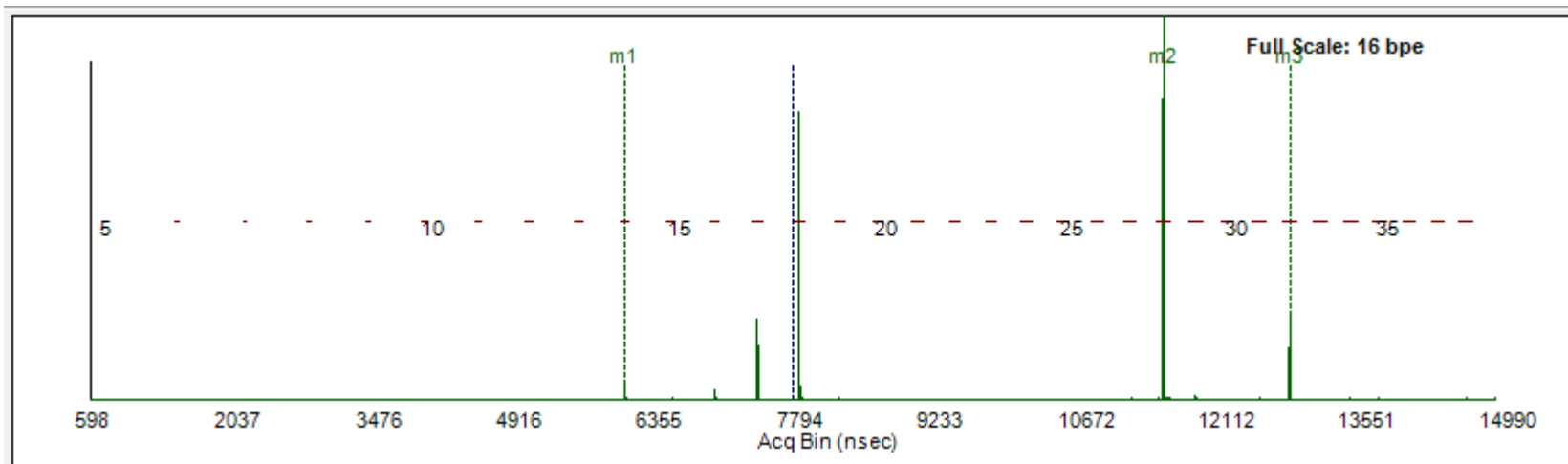
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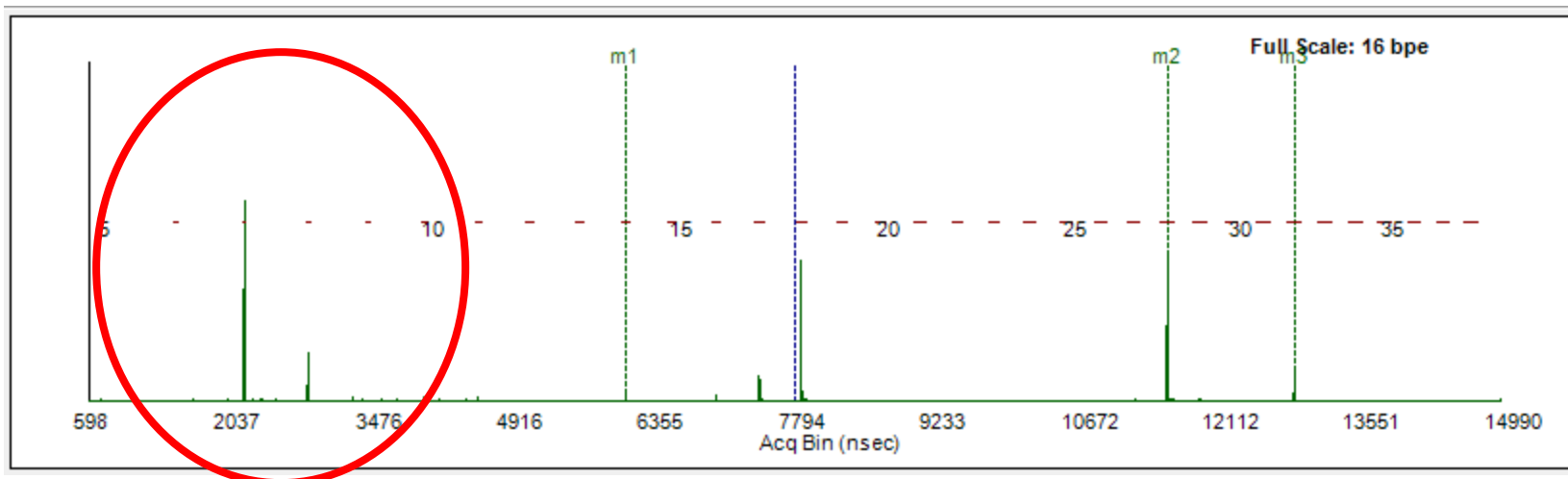


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Lens = 3100V



Lens = 2000V



I Lost my PToF signal, what can I do to fix?

- PToF Issues are usually chopper related. The first thing to check is that the chopper is a clean square wave, and that it is set to a reasonable frequency. If that is not the case, follow the chopper calibration procedure.

[Chopper Frequency Calibration.ppt](#)

- If the chopper is okay, the problem may be that the NI-6024e card is “hung up” and needs to be reset. Don’t just simply restart the computer, but shut it down, and unplug for several seconds.



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