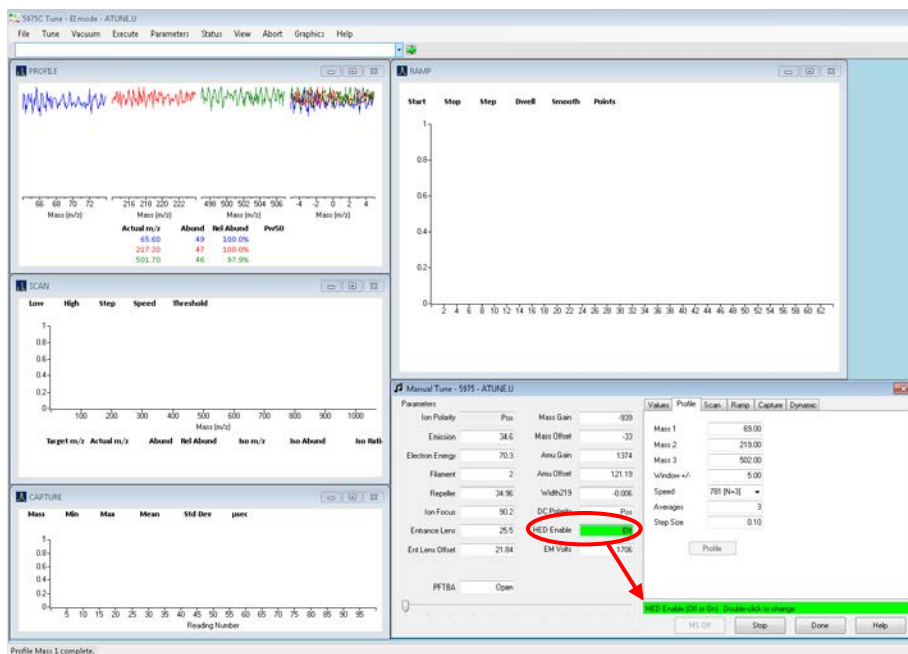


Job Aid: Cleaning HED Detector Assemblies

The cleaning process for the HED assembly is recommended when the GCMS has high noise background or spiking with the HED on. This can happen if there are any particles on the metal surfaces of the HED or the bare metal wire inside. It can occur anytime you open and close the analyzer. Most times a gentle puff of the gas out of a can of air duster is sufficient to dislodge any particles. If that doesn't work here are the next steps.

For noise problems, first test it with the EM voltage reduced and the HED power supply off:

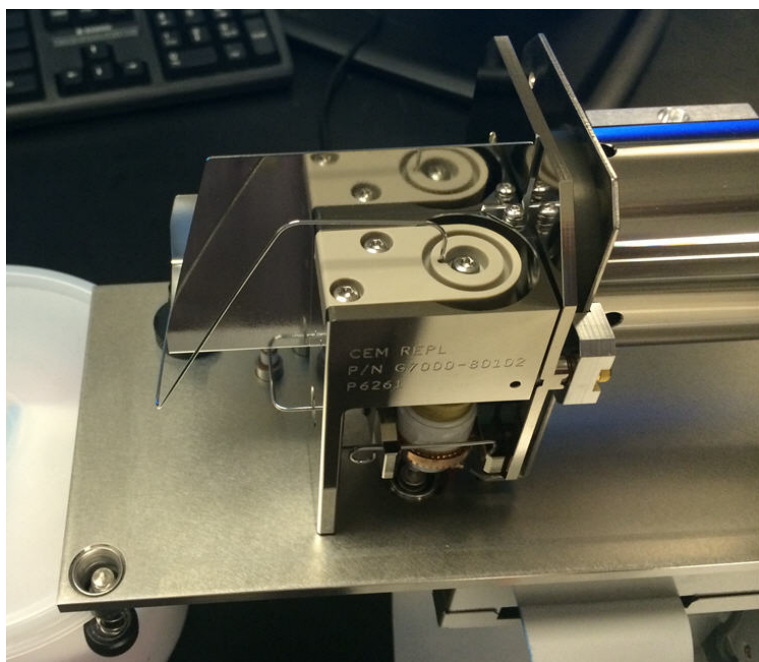


Does the background noise change?

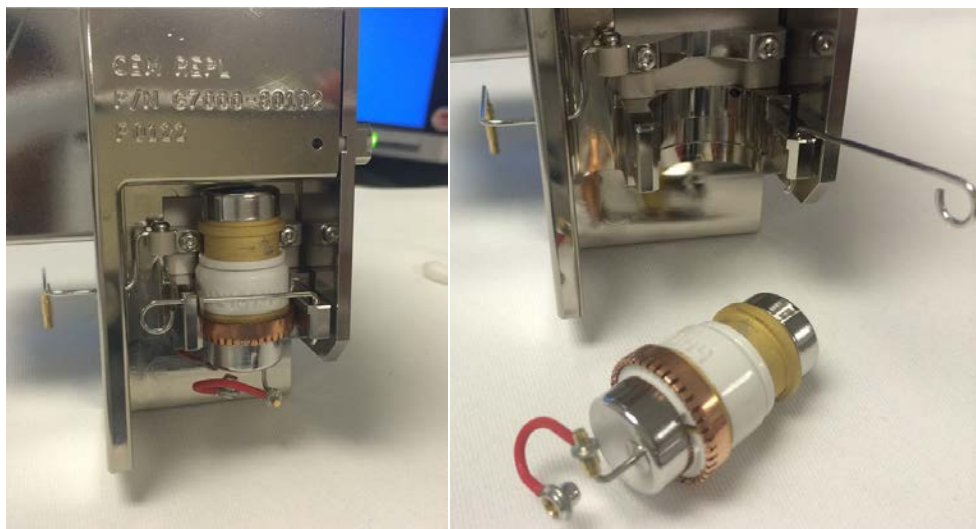
[In MSD Chemstation on the command line, type MSPARM HED,,OFF. Verify that it is off in the tune parameters and then monitor the baseline.]

This cleaning should certainly be attempted before thinking about replacing it. Wear latex or nitrile gloves – you want to avoid any dust or particulates coming off fabric ones. The HED and the EM are customer replaceable consumable parts.

1. Remove the detector assembly from the analyzer. Do not allow the ceramic quad centering ring to drop. This is the most dangerous step. If the quad falls and either chips, cracks, or breaks, the cost is approximately \$12,500 to replace it as the only repair part that includes the quadropole is the entire analyzer assembly.



2. Remove the EM from structure. The EM is a consumable part.



Job Aid: Cleaning HED Detector Assemblies

3. With EM horn facing downward, squirt LC grade isopropyl alcohol into horn.



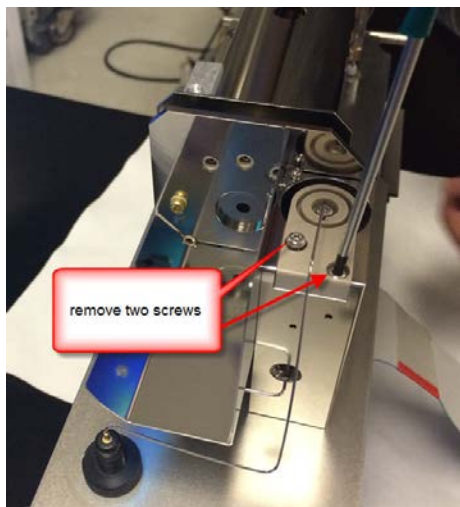
If you use canned duster, make sure and hold the can vertically/upright. DO NOT spray with the liquid out of the can!

4. Before IPA self-dries, use compressed nitrogen or clean canned air duster to dry out horn.

5. Repeat as necessary until all particles and solvent-spots are removed.

6. Wash the red wire with IPA and then dry it with a lint free cloth as well. The red insulation attracts dust particles.

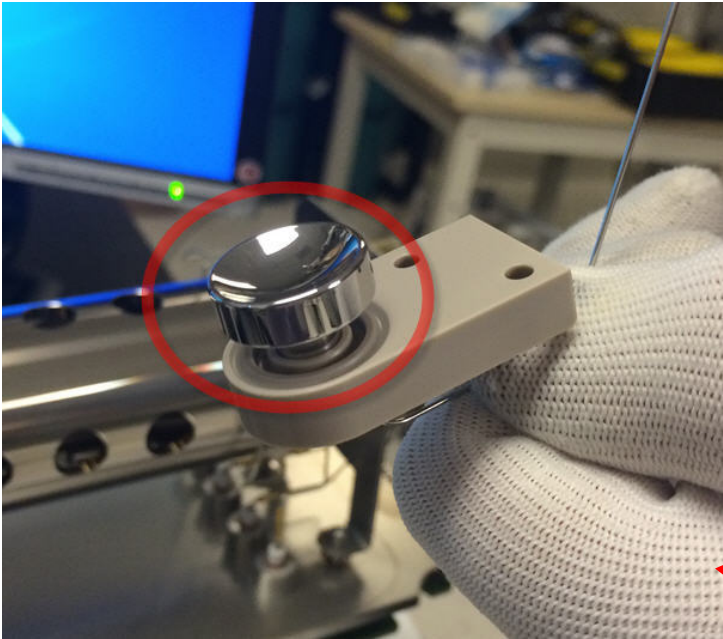
7. Remove dynode assembly from structure. You will need a T10, a T6 or a 1.5mm hex depending on the age of the instrument.



[The word Dynode was first used in 1922. It is a “plate that emits impact electrons”. It is just a metal plate with -10,000V on it, so replacing it only gets you one cleaned at the factory.]

Job Aid: Cleaning HED Detector Assemblies

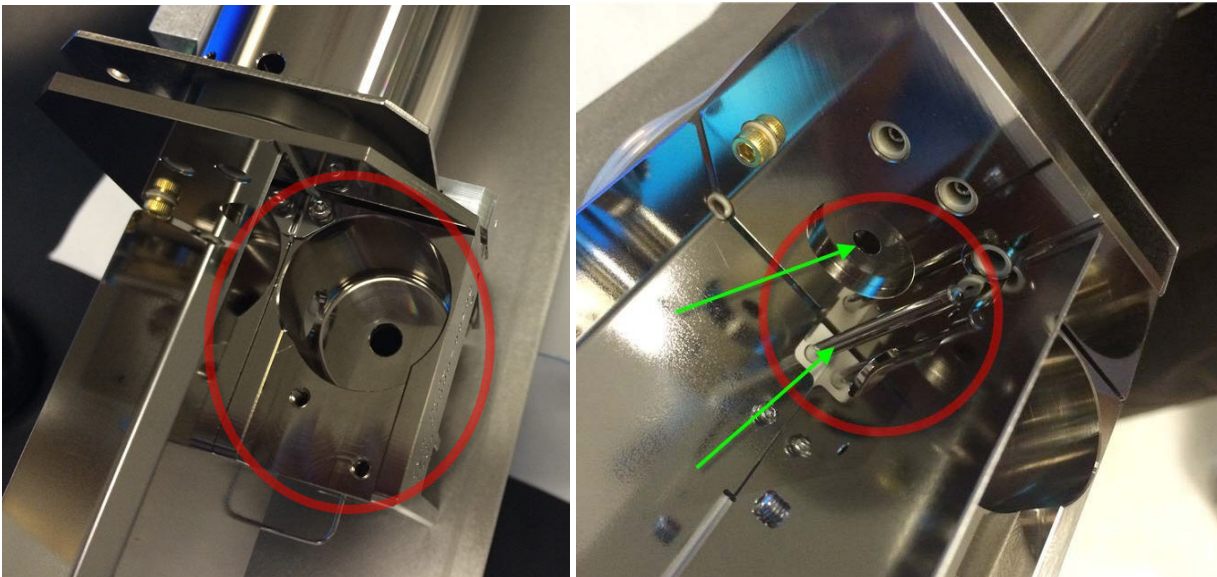
8. Using a soft lint-free cloth, hand polish the dynode face with isopropyl alcohol. Gently polish as any scratches on the dynode may cause noise. Wipe the edge off and also the entire hard wire as well. The wire is at -10kV as well and any dust on it will cause noise.



Wear latex or nitrile gloves, not these. You want to avoid any dust or particulates.

9. Before the IPA self-dries, use compressed nitrogen or clean canned air duster to dry off dynode. DO NOT submerge in any liquid or try to bake it!

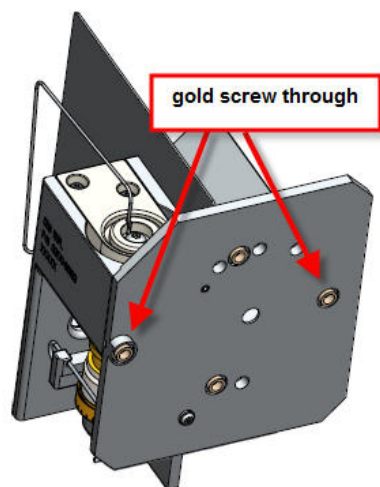
10. Use a lint-free soft-tipped swab wetted with isopropyl alcohol to clean all areas indicated. Blow dry.



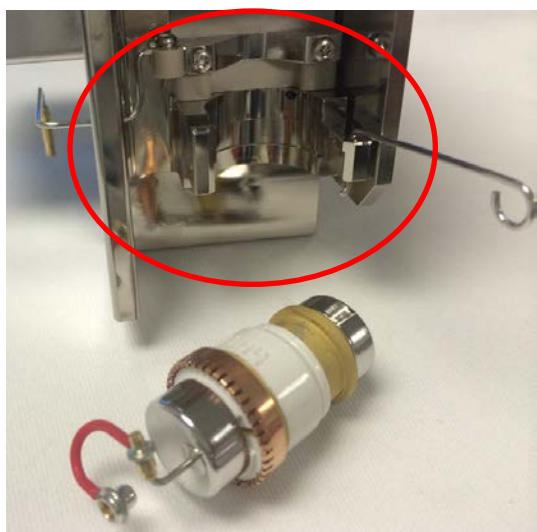
Job Aid: Cleaning HED Detector Assemblies

11. Inspect to make sure that there are absolutely no particulates anywhere inside and then reinstall the HED onto the detector assembly.

12. Clean out the two gold screw through-holes.



13. Use a lint-free soft-tipped swab wetted with isopropyl alcohol to clean all areas indicated. Blow dry. Inspect for any particles and then reinstall the Electron Multiplier onto the detector assembly. Make sure and route the wire correctly.



14. Before IPA self-dries, use compressed nitrogen or clean canned air duster to dry out holes.

15. Reassemble HED detector into analyzer.

Job Aid: Cleaning HED Detector Assemblies



16. Wipe out the MS manifold with IPA on a lint free cloth. Inspect for any particles.
17. Reinstall the analyzer onto the system making sure not to allow any particulates to fall onto the freshly cleaned and dust free area near the detector end.
18. Pump the system down.
19. Wait a minimum of 2 hours with the instrument pumped down and the source and quad(s) at operating temperature.
20. Autotune.