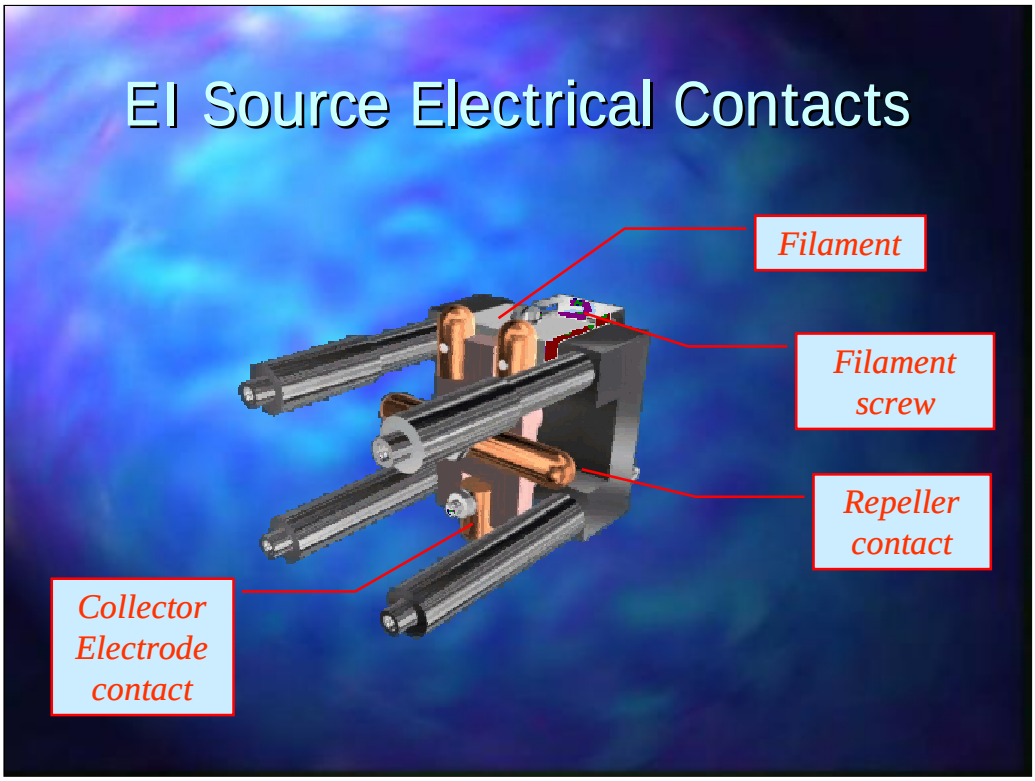
Cleaning of the Ion Source

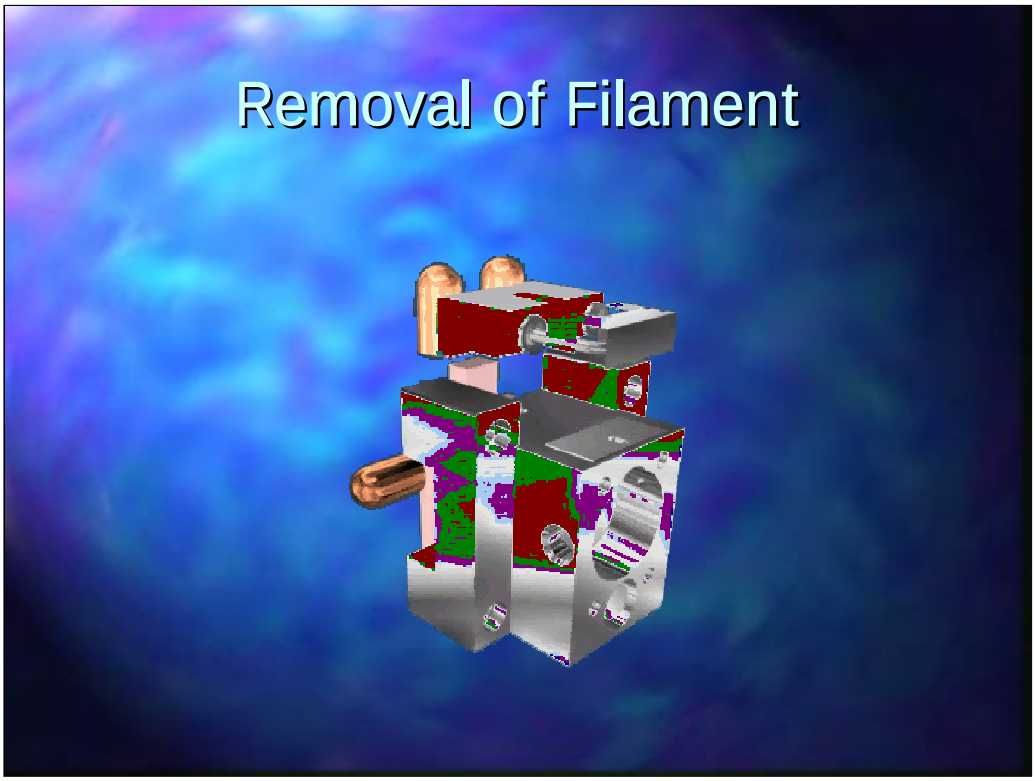
And routine maintenance



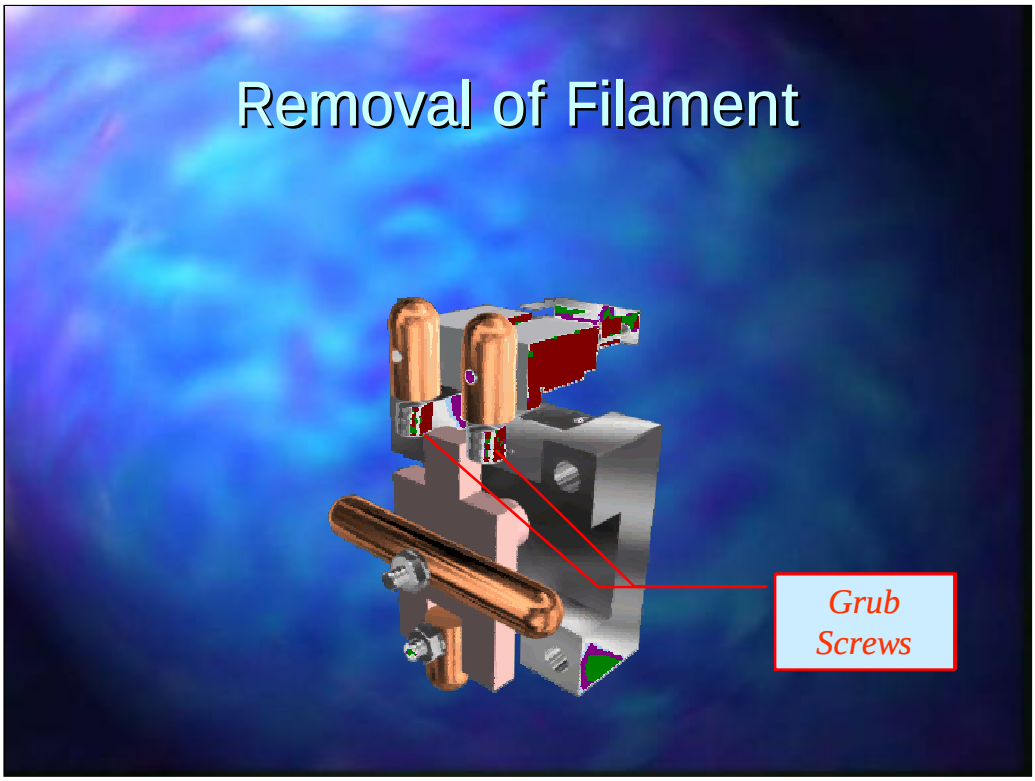
Throughout this series of slides the ion source is shown disconnected from its handle and seal assembly. This has been done for clarity. In practice it is not necessary to separate the 2 parts.

When handling the source always wear talc free neoprene gloves. Do not touch the source with bare hands.

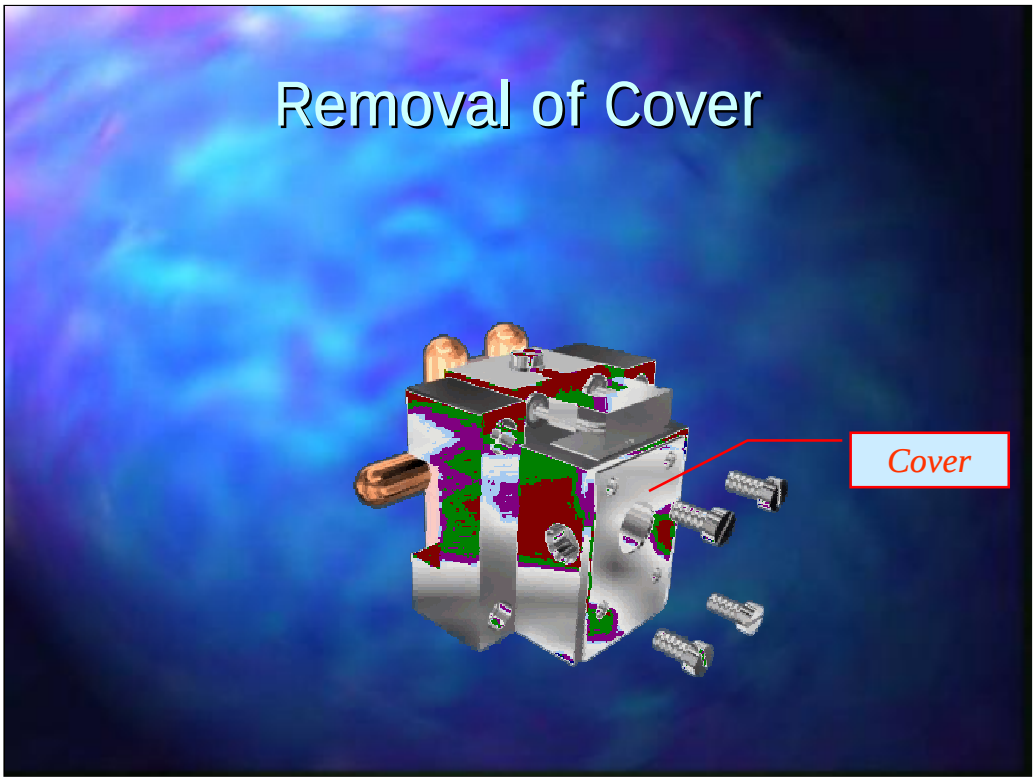
Removal of Filament



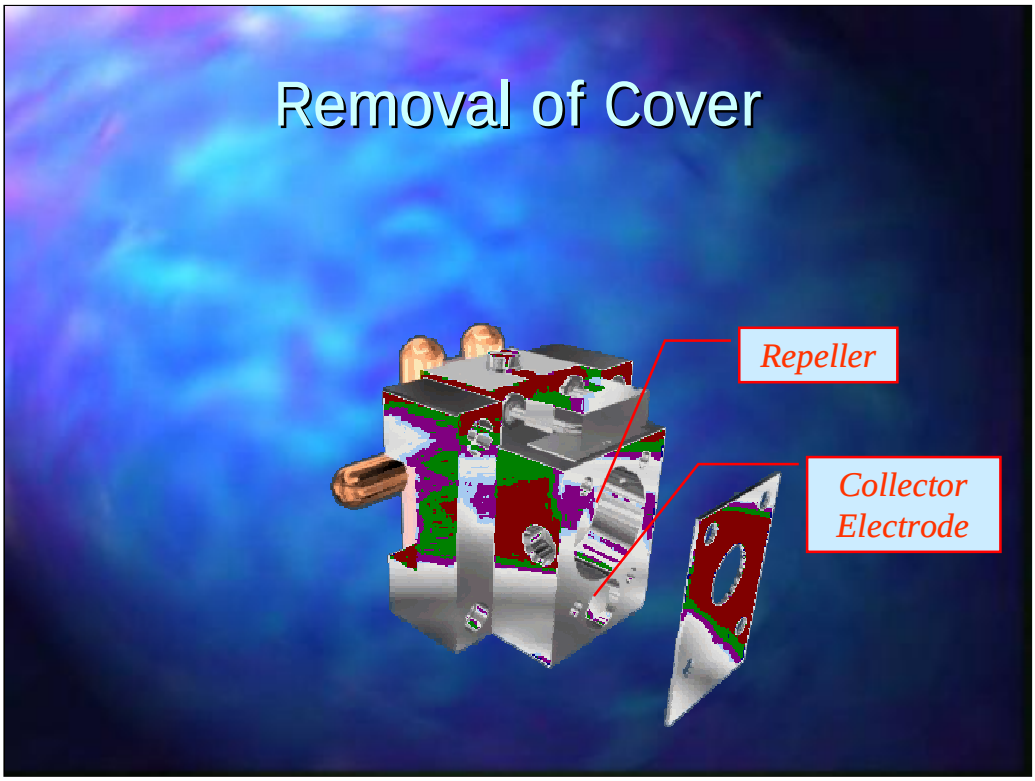
For cleaning the source it is first necessary to remove the filament by removing the screw holding it to the ion source and lifting off the filament.



If the filament is broken it will be necessary to remove the contacts from the old filament and put them on the new filament. This is done by slackening the grub screws shown above with the small allen key provided in the toolkit.

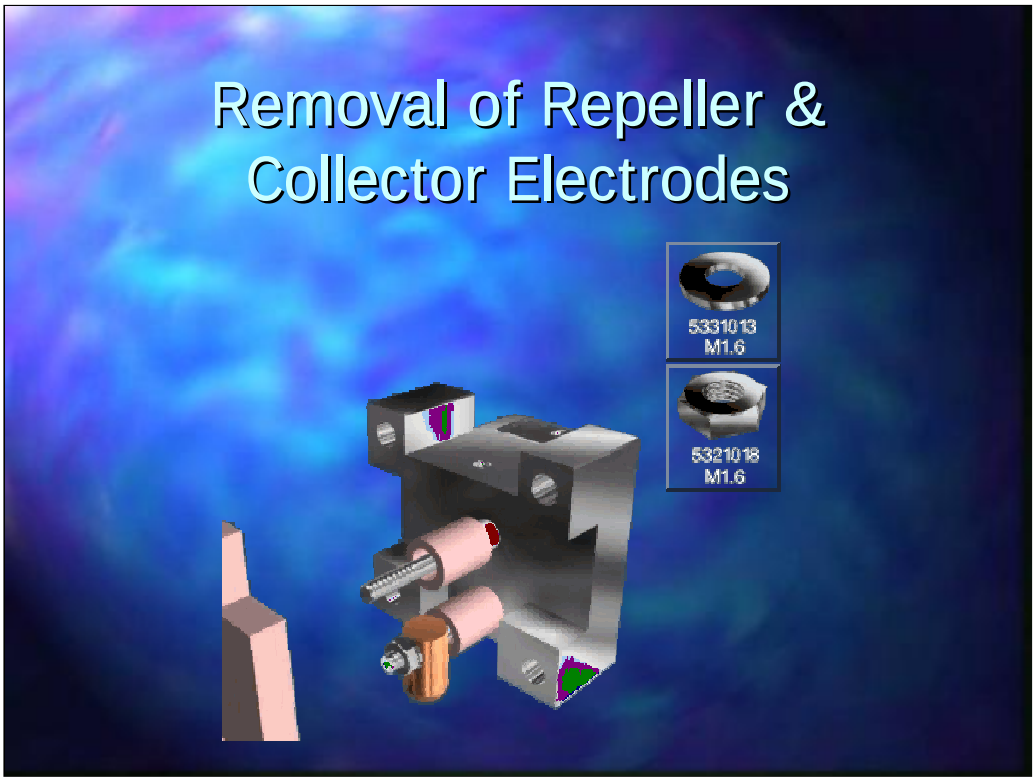


To be able to remove the electrode for cleaning the cover must first be removed from the source by releasing the 4 screws holding it to the source



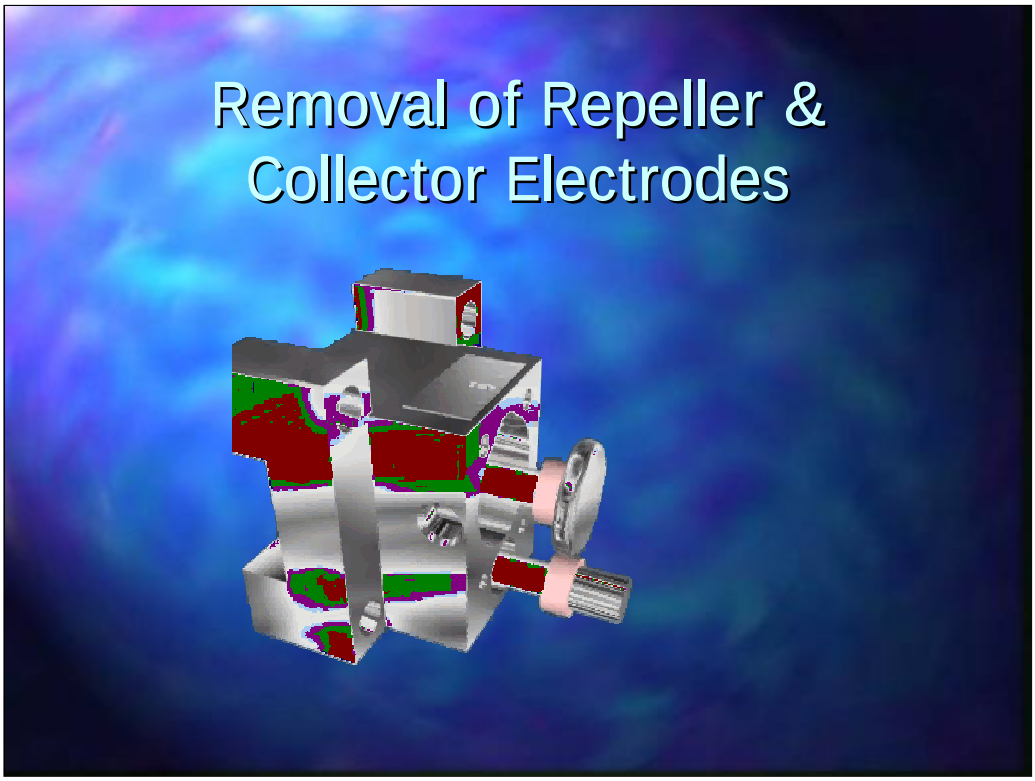
When the cover has been removed the Repeller and the Collector electrodes can be seen

Remove the Repeller by unscrewing the nut holding the repeller contact using the 3.2mm spanner provided in the toolkit and remove the nut and washer

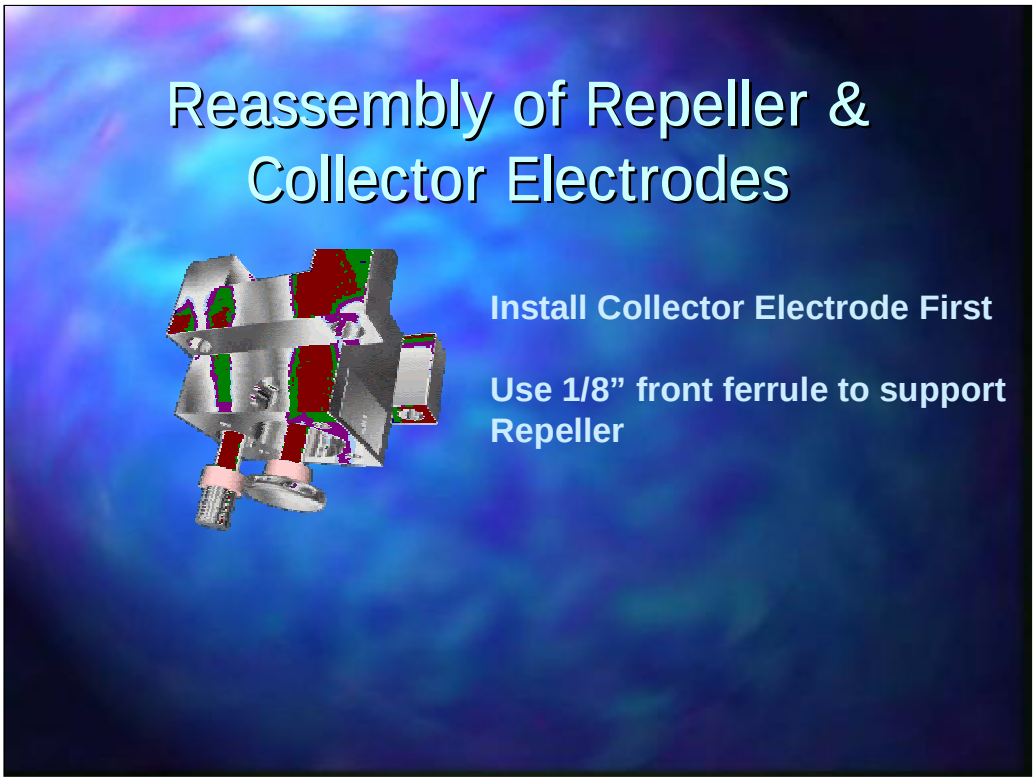


Remove the contact and the large ceramic insulator from the source. Allow the Repeller to fall out of the ion source. There are 3 ceramic insulators around the Repeller, a long thin one, a short fat one and a longer fat one.

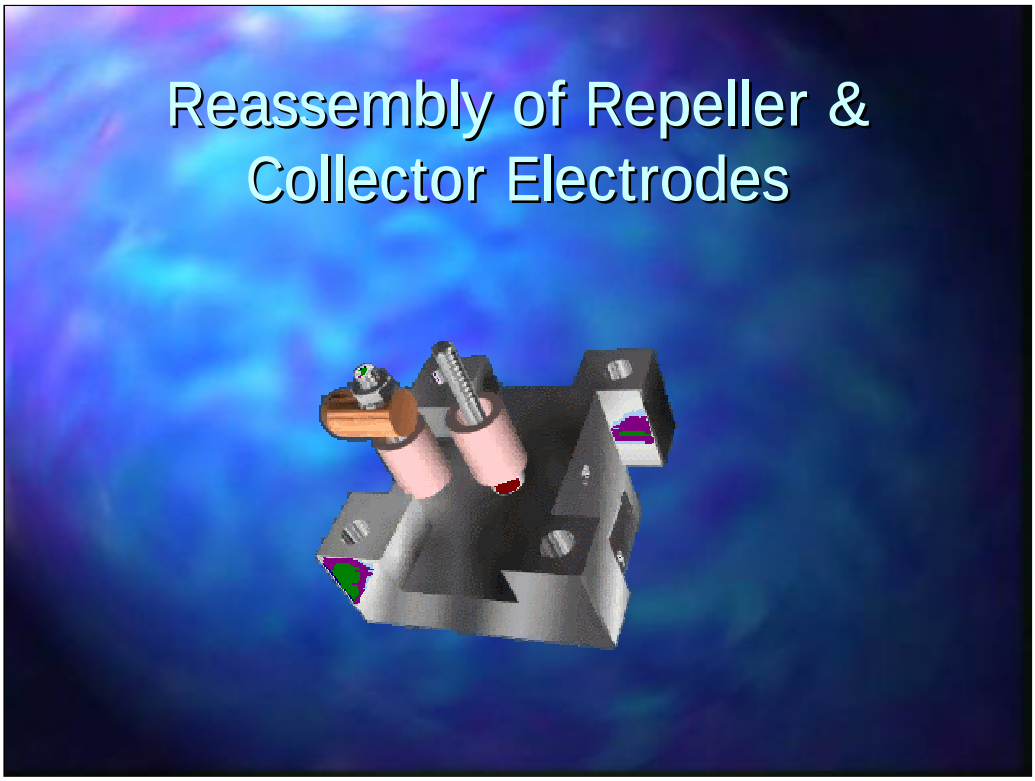
Now remove the Collector electrode by releasing the nut next to the contact. The collector is also insulated from the ion source using identical ceramic insulators as those used on the Repeller.



When the nuts have been removed both the Repeller and the Collector electrodes are removed as shown. Both electrodes will probably need to be cleaned. Gently rub the surface of the electrodes with the very fine (6000 grade) emery paper that is supplied with the tool kit until all traces of contamination have been removed. Rinse the electrodes with as suitable solvent such as methanol or acetone and allow to dry. The ceramics do not usually need to be cleaned but if they are evidently dirty then place them in a beaker of a suitable solvent and place in an ultra-sonic bath.

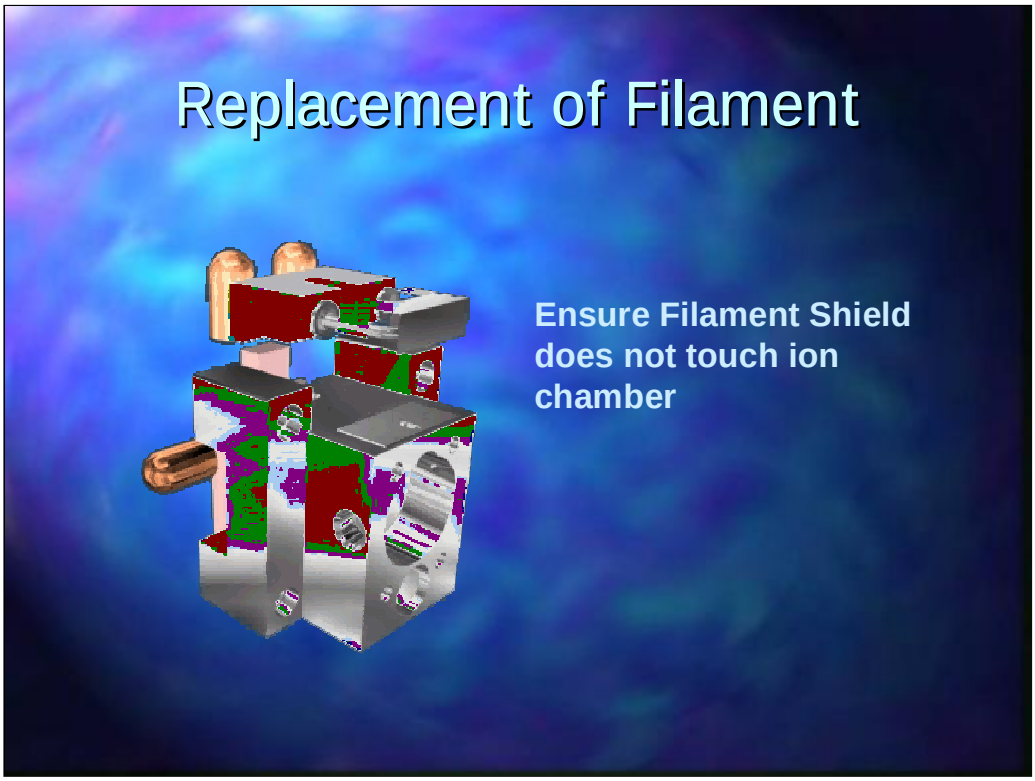


To reassemble the source install the collector electrode first. Slide the long thin ceramic over the electrode followed by the small fat ceramic, ensuring that the first ceramic passes all the way through the second. Holding the electrode in position turn the assembly so that the front of the source is facing downwards and rests on the bench.



Slide the remaining ceramic insulator over the electrode followed by the contact, the washer and the nut. Tighten the nut loosely at this stage. Repeat the steps for the repeller. However, the repeller sits at the back of the ion chamber and to hold it in the correct position whist the nut is placed on the thread it will be necessary to rest the repeller on a spacer. A Swagelock 1/8 inch brass ferrule acts as a suitable spacer

Replace the large ceramic insulator over the repeller ensuring the the collector electrode contact sits between the 2 forks at one end of the ceramic. Place the repeller contact over the repeller with flat surface downwards and a right angles to the collector electrode contact. Fit the washer and then the nut. Loosely tighten the nut but do not fully tighten yet.



Replace the filament ensuring that as the screw is tightened the filament is pushed so that the screw rests right at the end of the slot in the filament assembly. Check that the cover of the filament is not in contact with the ion source body.

Now gently tighten the screws on both the repeller and the collector electrode. Do not over tighten these as there is a danger that the ceramic insulators may be crushed and break.

Lastly refit the cover and check again that the filament cover is not shorting out on the ion source assembly.


TurboMass
Routine Maintenance

Daily tasks

- Check air/water background
  - Leak check if necessary
- Record in Logbook

Weekly Checks

- Check tune and mass calibration
  - Re-tune if necessary
    - (re-tune will also require quant recalibration)
- Check fore pump oil
  - Top up if necessary
- Record in Logbook

Fore Pump

Monthly Checks

- Clean rear fan filter
- Check reference gas vial
  - Fill if necessary (max 200µl)
- Record in Logbook

Monthly Software Maintenance (1)

Necessary to ensure that the computer operates at maximum efficiency

- Create a new project each month
- Delete all files in c:\temp
- Delete all files in c:\turbomass\turbomass\ver 4.3.0\log
- Delete all files in c:\turbomass\turbomass\ver 4.3.0\temp
- Delete any other unwanted files
- Empty recycle bin

Monthly Software Maintenance (2)

- Defragment the hard drive using disk keeper lite
  - Also defragment other hard drives that are used
- If after defragmentation a lot of light blue lines are apparent move the TurboMass directories to another drive and defragment again
- Move directories back to the original drive
- Re-boot the PC and open TurboMass in a new project

Six Monthly Checks

- Replace fore pump oil
- Check Inner source
  - Clean if necessary
- Record in Logbook

Yearly Checks

- Check lenses and pre-filter assembly (Trained engineers only)
  - Clean if dirty
- Record in Logbook