90-0497 Lonestar External Inlet Filter - Replacing the Filter Membrane - Customer Procedure

Issue/Version	Date	Author	Details
001	29/1/15	AP	New document

Contents

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Warning Labels

This symbol is used to highlight a section explaining particularly important safety considerations

This warning label indicates danger of electrical shock hazard

This warning label indicates parts of the product that will become hot during use. Please take care.

Introduction

Document Purpose

The purpose of this document is to detail the process to successfully replace the PTFE filter membrane in a standalone external Inlet Filter (Cole Palmer type, 01-0195) and obtain a clean and leak tight filter.

Related Documents

None

Nomenclature

Term or abbreviation	Meaning

Procedure Purpose

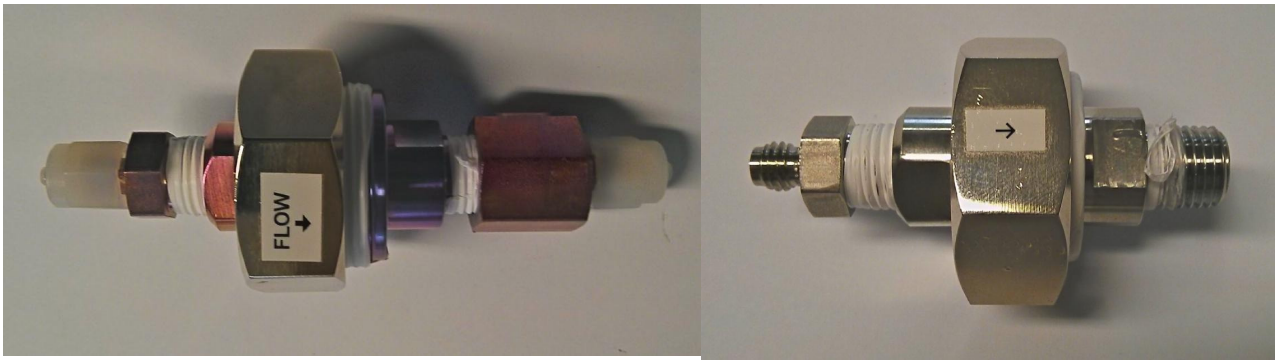
The purpose of this procedure is to allow you to successfully dismantle, clean and reassemble an external Inlet Filter of the type based on a Cole Palmer filter to obtain a

- clean
- leak-tight

filter that will sufficiently protect the Lonestar FAIMS chip from any contamination.

There are two configurations of these filters, either

- as a standalone to be used with 1/8 Swagelok connections, such as used with a FAIMS CORE (below left)
- screwed directly into a Lonestar (below right)



This second part procedure showing how to change the filter membrane uses pictures of the filter type used with a FAIMS CORE, but the filter membrane change process is identical for either type.

Removing the Inlet Filter from the Lonestar

To remove the Inlet Filter you will need

- a 5/8 spanner (01-0545), which has been ground down to make it narrower than a standard spanner
- Clean, fine nose tweezers
- A clean air source (highly filtered - no grease, particles < 5um), such as a CRC Air Duster (RS 780-5307), pictured right
- Nitrile gloves

If the Lonestar has not been allowed to cool down sufficiently, the filter could be hot - the inside of the Lonestar is heated to 100C.

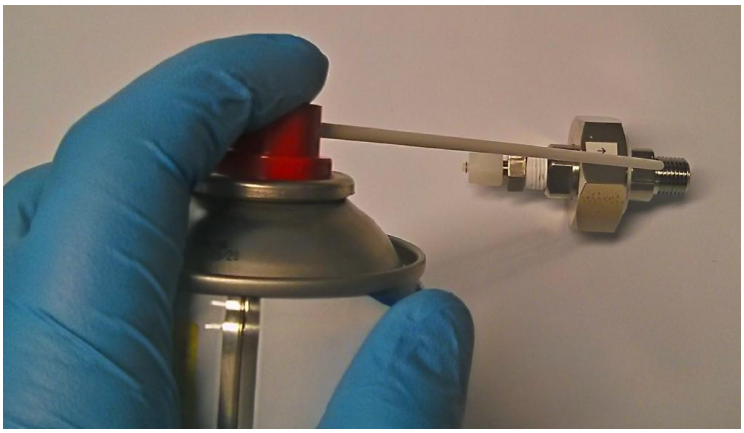
Wearing the gloves, clean the tweezers using IPA or acetone to remove any traces of grease or other contaminants.

Use the ground down (thinner) 5/8" spanner to unscrew the filter, using it on the side of the filter closest to the Lonestar.

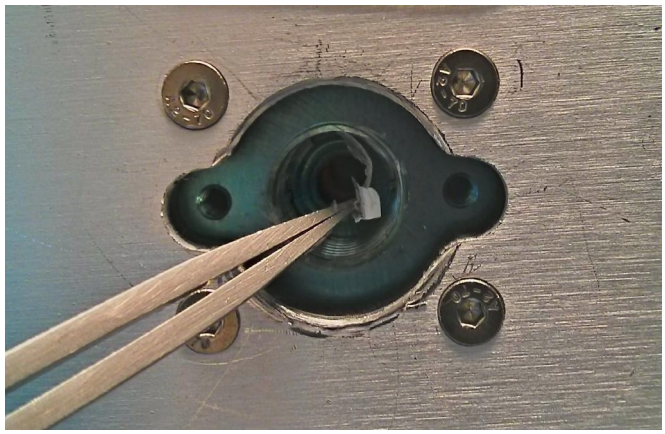
Once removed, there will be fine threads of PTFE on the filter ***AND*** on the inlet thread to the Lonestar.

These PTFE threads need to be removed **VERY CAREFULLY AND COMPLETELY** using the clean tweezers, and an air blow, otherwise they could end up on the FAIMS chip and cause the ion current measurement to become noisy.

Once most material has been removed from the thread on the **inlet filter**, an air blow around the thread can remove smaller pieces.



Do the same for the Lonestar inlet, using tweezers



and then with the air blow.

Be very careful when doing this and ONLY BLOW WHEN THE NOZZLE IS FULLY INSERTED, otherwise you may blow debris INTO the Lonestar. This will contaminate the chip and require the unit to be sent back to Owlstone for repair.

When the filter has been serviced (see next section), reapply ONLY 2 turns of PTFE tape to the thread clockwise looking from the end that will be screwed in.

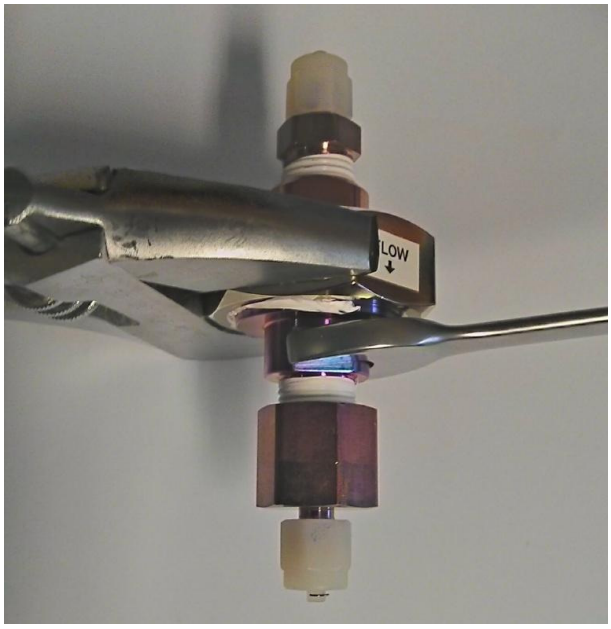
Screw in the filter and tighten with a 5/8 spanner.

Opening and Cleaning the Inlet Filter

To open and clean the Inlet Filter you will need, in addition

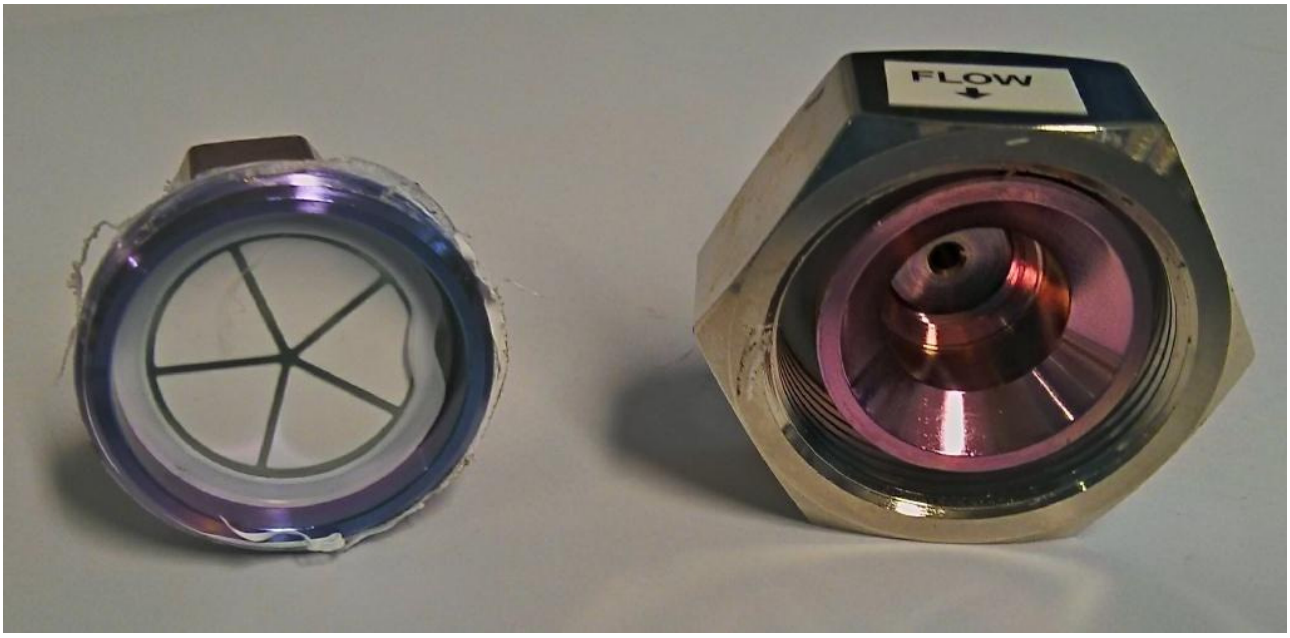
- a large spanner, such as an adjustable with a jaw opening of 40mm (about 1.6in)

Use the adjustable to hold the large silver nut as shown in the picture below, and unscrew using the 5/8 spanner.



When opened the inside of the filter should look like the image below.

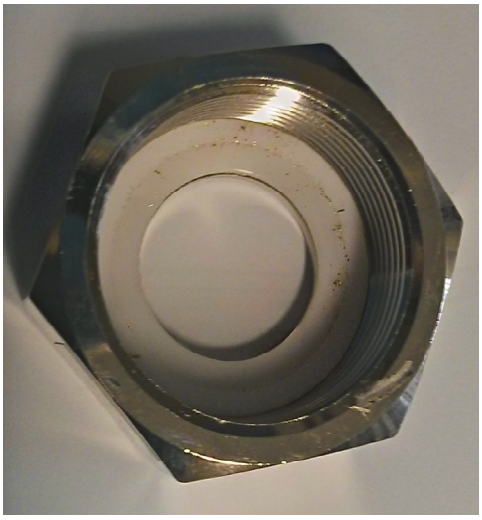
The white PTFE ring on the left hand part has a kink in it, which shows it has been over tightened. This filter would not have been leaktight.

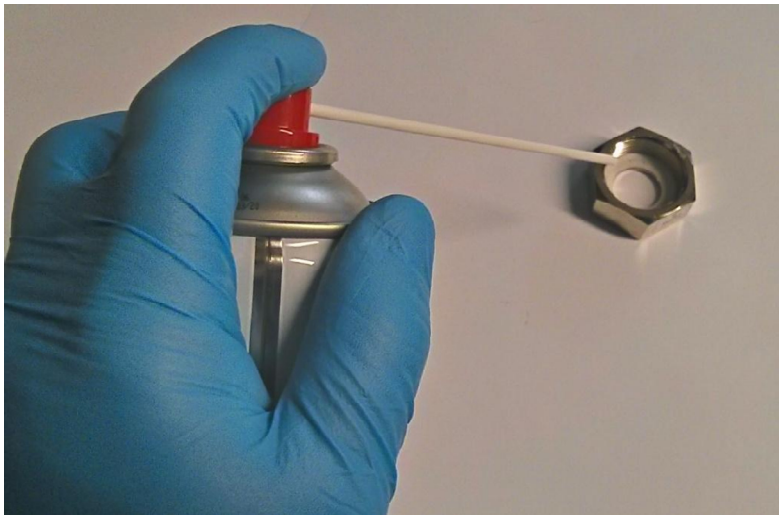


Remove and discard the PTFE gaskets, the metal filter supports and the filter membrane.

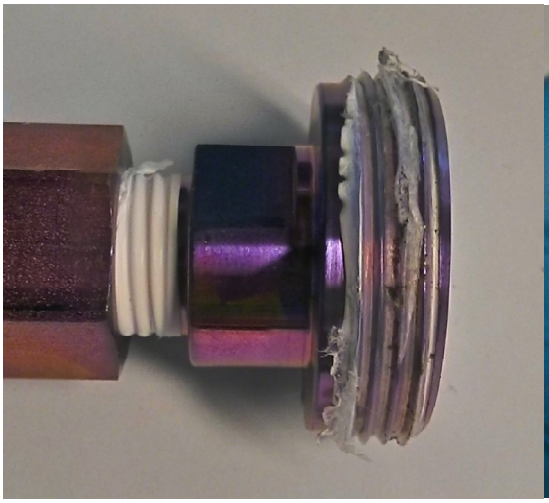
These parts, and the inside of the filter may have been exposed to toxic or biologically harmful chemicals. Wear gloves when dismantling and discard of the internal parts as appropriate considering the chemicals they may have come into contact with.

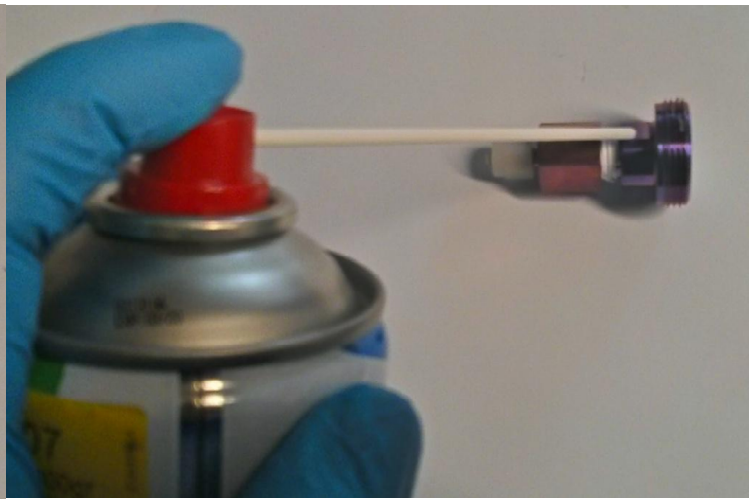
The silver nut has a PTFE insert which usually gets covered in brass particles from the thread as shown below left. Use the clean air blow to remove this debris as shown below right.





Now use the fine tweezers to remove most of the old PTFE tape, below left. Finally, use the clean air to blow the remaining small pieces of the PTFE from the thread (below right)





Replacing the Filter and Rebuilding the Inlet Filter

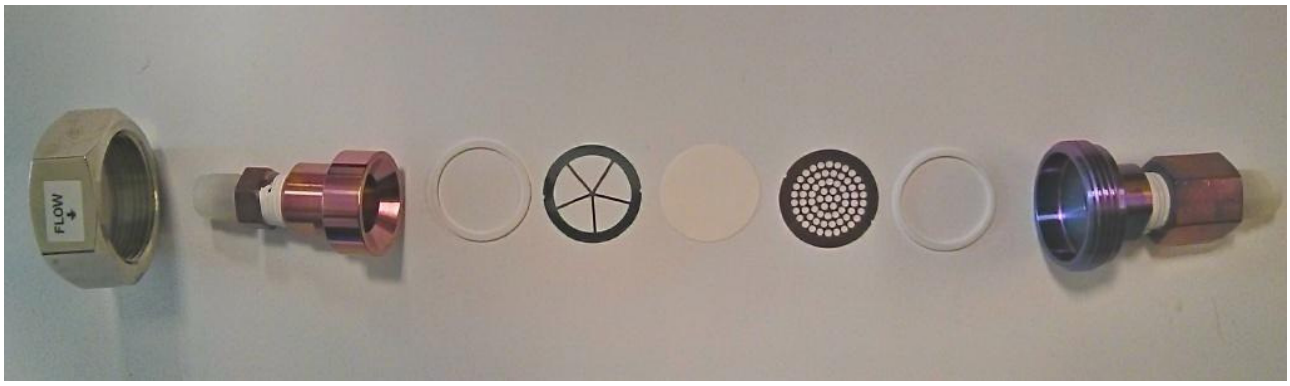
To reassemble the filter you will need

- a filter element (Membrane Filter, 1micron, Unlaminated, PTFE, 25mm dia, Owlstone PN 50-0622)
- two replacement PTFE gaskets Ls25 Owlstone PN: 50-0987, Cole Palmer PN: 02930-20)
- Pentacle Filter Support (Owlstone PN: 02-0779)

- Filter Support (Owlstone PN: 02-0807)
- Oil Free, PTFE Thread sealant, 6.4mm wide (Owlstone PN: 50-1054).

These parts are shown in the picture below with, from the left

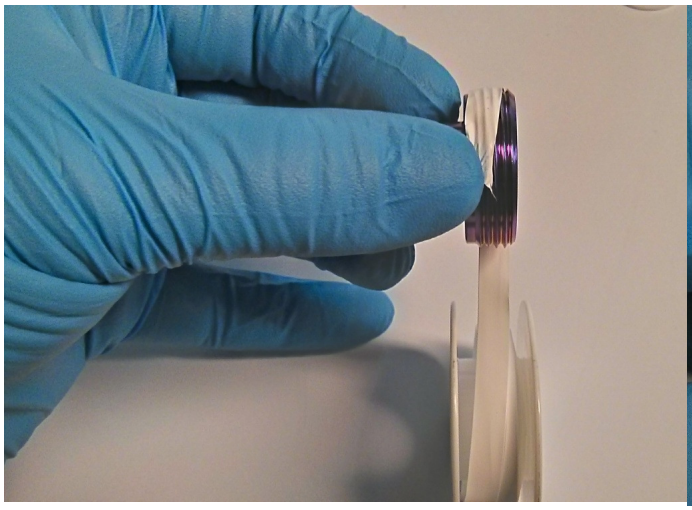
- Nut, filter body, PTFE Gasket, Pentacle Filter Support, filter, Filter Support, PTFE Gasket, filter body,

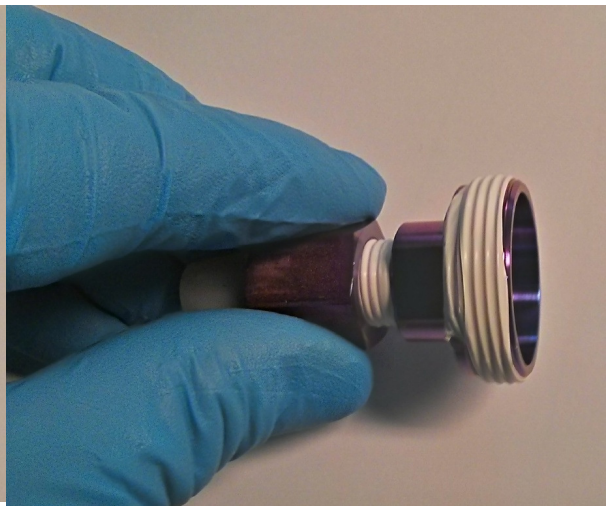


To assemble, firstly wrap the PTFE tape around the thread of the filter as shown. Use a finger to hold it in place at the start **and wrap in the direction shown** so that the tape is "laid down" as the thread is screwed in.

Only wrap the tape around twice - any less and you will not get a sufficient seal so the filter will leak, any more and it will be too thick and difficult to screw in.

Do not allow the PTFE tape to overhang the end of the filter as this could also cause a leak where the PTFE gasket does not seal





Place the parts inside the filter body in the order shown above.

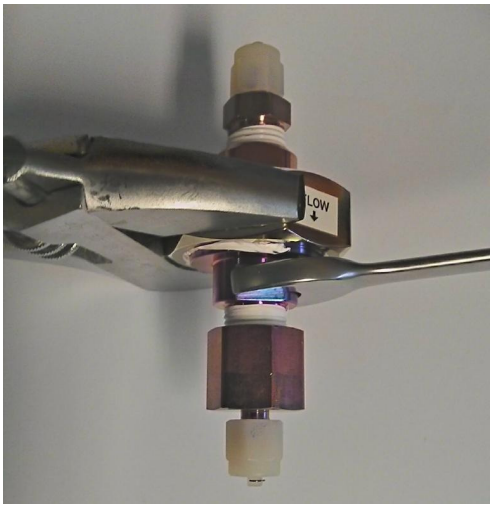
Use clean tweezers to handle the parts, especially the filter membrane.

Screw the nut in place by hand and then using the two spanners again as shown below.

Screw the parts together until the point at which you will be able to rotate the two outer parts if the filter independently, but only just.

At this point **tighten the two parts (nut and filter body) a further 1/4 of a turn:**

- any less than 1/4 turn and the filter will leak
- any more than 1/4 turn and the PTFE gasket will be damaged and the filter will leak.



Your inlet filter should now be leaktight and ready to use.

About Owlstone

Owlstone develops and commercializes innovative new technologies to address the critical need for compact, dependable and cost-effective chemical and biological detection solutions for a wide range of markets.

Owlstone was formed through the recognition of the opportunities created by the application of micro- and nano- technology to develop improved sensing solutions.

Owlstone is focused on the innovation of detection technologies to address unmet needs, developing solutions that are flexible enough to target a range of markets with the potential for growth by enabling new application opportunities.

From homeland security to home safety, Owlstone is working with leading manufacturers and integrators across a range of markets to develop products incorporating our microchip chemical sensing solution.

Owlstone is headquartered in the United States and has laboratory facilities in the United Kingdom. Owlstone Ltd was founded in 2003 with a seed investment of two million dollars from Advance Nanotech, Inc., a New York based company specializing in the investment in and commercialization of nanotechnologies.

