

Title: Operation of the MTL AH225 Automated Filter Weighing System		Copy No: ##
SOP No.: 6.21/1.1/S	Effective Date: September 23, 2013	Location: ###

QSM Approval: _____

Operation of the MTL AH225 Automated Filter Weighing System

1. Introduction and Scope

- 1.1. This SOP provides procedures for the regular operation of the automated Filter Weighing System (here after referred to as the “Autohandler” or “AH”).
- 1.2. The Autohandler is used for the mass determination of air particulates deposited on 47 mm o-ring mounted Teflon Membrane Filters used in the National Air Pollution Surveillance Network (NAPS) network and other projects using 6.08/*./M and 6.10/*./S. A Mettler MX5 microbalance is incorporated within the Autohandler.
- 1.3. The Autohandler should be operated only by those who have working experience on this instrument.

2. Instrument Set-up

- 2.1. Check Autohandler status. If Autohandler in ON, go to Step 2.1.2.
 - 2.1.1. If Autohandler is not already on, turn on the power switch at the back right of the instrument, and then turn the red dial on the front of the instrument counter clockwise until the green light illuminates.
 - 2.1.2. Turn on the Personal Computer (PC) connected to the instrument, and double click on the “FWS” icon on the desktop.
 - 2.1.3. Click on “Automated Filter Weighing”.
- 2.2. Check the Microbalance Status. If the balance is ON, go to Step 2.2.2.
 - 2.2.1. If the balance is not already on, turn it on by depressing the On/Off button on the lower left corner.
 - 2.2.2. The balance must have been on for at least 2 hours prior to any weighing.

3. Procedure Creation/Edit

- 3.1 One may create a Procedure by editing any existing procedure, and saving the changes under a new name.
- 3.2 The name of the current procedure is displayed in the upper right hand side title box beside the word “procedure”

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- 3.3 Click on “Configure Procedure” and enter the password to begin editing/creating a procedure. For details, refer to “MTL Filter Weighing System User’s Guide, 1/11/2008”.
- 3.4 If modifications were made to a procedure, it should be saved under a new name.

4. Assigning Carriers and Samples

- 4.1 Teflon filters are placed in metal “Carriers” for weighing. Each carrier is uniquely identified by a number on its left side (i.e. C00001) and a computer barcode on its underside.
- 4.2 To assign a specific carrier to a Filter sample identification, click on “Assign Carriers” when in the “Automated Filter weighing” screen.
- 4.3 Using the manual barcode scanner, aim at the bottom barcode on the carrier and depress the trigger.
- 4.4 Type in the sample identification in the window on screen with the blinking cursor and click “OK”.
- 4.5 Repeat as necessary for all samples.

5. Loading Samples and Quality Assurance (QA) filters

- 5.1 Remove the 3 QA filters from their Petri dishes using non-serrated tweezers and place into their assigned carriers. (Consult method 6.08/*.*M)
- 5.2 Pick up the carrier containing the first filter, and pass it through the static dissipating Polonium strips.
- 5.3 Open the “Input Silo 1” door and place the carrier inside, repeating this step for the remaining 2 QA filters and all other sample filters that are to be measured.
- 5.4 After the last carrier is placed in the Input Silo 1, close the door.
- 5.5 Repeat step 5.1 to 5.4 using Input Silo 2 if necessary.
- 5.6 Any filters that have a hole or tear are not measured in the Autohandler. They are placed in their appropriate sequentially numbered carrier, and subsequently weighed manually on the other Mettler MX-5 microbalance in the laboratory (see method 6.08/*.*M).
- 5.7 Record the date; sample ID’s, temperature, humidity and operator initials in the laboratory logbook beside the instrument.

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6. Running Procedure

- 6.1. In the Automated Filter Weighing application, in the Procedure pull down menu, select "Filter Procedure".
- 6.2. Click on "Begin Procedure"
- 6.3. The balance automatically performs an internal calibration, and then weighs a Stainless Steel 100mg standard weight, followed by the weighing of the 3 QA filters and all samples found in the Input Silos.
- 6.4. After sample measurements, the carriers and filters will be found in the appropriate "Output Silo 1, 2 or 3".
- 6.5. Remove at least 10% of the previously weighed samples from the output silo, and return them to the Input silo along with the 3 QA filters for Quality Assurance (QA) repeat measurements.
- 6.6. Measure these repeat QA samples by following steps 6.1 and 6.2.

7. Unloading Samples

- 7.1. After measurement the carriers will be found in the "Output Silo".
- 7.2. Open the Silo door, and remove the carrier, then remove the Filter from the carrier returning it to its appropriate Petri dish.

8. Recording of Data

- 8.1. Upon completion of the Procedure a report is automatically prepared. It is located in the C:\MTL FWS\Reports\Procedures directory. There will be two reports. The first report contains the measured samples and 3 QA filters, the second report contains the 10% reweighed samples and the reweigh of 3 QA filters.
- 8.2. Open the procedure file using MS Excel®. Confirm that all the samples in the silos were measured. If not they need to be re-measured. Located in the column labeled "Final Weight" will be the mass results in milligrams. These results are labeled by the cassette number from 1 to 100.
- 8.3. Convert these values from mg to µg multiplying by 1000 and copy these new sample values to the appropriate Excel® file for the set of filters for a specific NAPS station, or as specified in other projects.
- 8.4. Copy the QA values from this sheet to the appropriate QA file for the Stainless Steel weight and the Teflon QA filters.

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8.5. Consult Methods and SOP's 6.08/*./M, 6.01/*./S and 6.10/*./S for information regarding sample reporting, transfer for analysis, storage and Quality Assurance.

9. Applicable Methods and SOPs

- 6.08/*./M, "Determination of the Weight of Particulate Matter Collected on Teflon[®] Membrane Filters"
- 6.01/*./S, "Sample Management"
- 6.10/*./S, "Preparation, Shipping, and Unloading of ChemComb Cartridges"

10. Revisions

- May 2011: Author: David Mathieu
New Standard Operating Procedure
- Sept 2013: Reviewer: David Mathieu
 - Section 1.2 Add reference to 6.08/*./M and 6.10/*./S
Add "Membrane" to description of Teflon Filter
 - Section 5 Rewrite Section to better describe measuring of QA filters with regular samples.
 - Section 8.5,9 Add references to SOP's 6.01/*./S and 6.10/*./S

11. References

"MTL Filter Weighing System User's Guide, 1/11/2008"

Lead Reviewer: David Mathieu
Title: Supervisor, Particulate Characterization Unit

Approved by: Ewa Dabek
Title: Head, Particulate Characterization Unit