

# UCD IMPROVE Technical Information #251G

## Post-Weigh Chamber Prep

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**DOCUMENT HISTORY**

<b>Date Modified</b>	<b>Initials</b>	<b>Section/s Modified</b>	<b>Brief Description of Modifications</b>
02/15/2022	SRS	All	Previously anthologized version separated into individual TIs.
04/19/2022	GRM	All	Updated wording to accommodate new procedures

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## 1. PURPOSE AND APPLICABILITY

The purpose of this TI is to describe in detail the procedures used at the Post-Weigh Chamber Prep station. It is applicable to all routine PTFE filters in the IMPROVE network that have been pre-weighed through the MTL AH500 chambers.

## 2. SUMMARY OF THE METHOD

Once all nylon, quartz, and their associated problem filters have been removed from a bin, it is ready to go to Post-Weigh Chamber Prep. Sampled PTFE filters and all problem filters are transferred from petri-dishes to carriers to be weighed through the MTL AH500 chambers. Filters are loaded into the MTL AH500 chambers and stored until they can be processed through Post-sample weigh-in station.

## 3. CAUTIONS

Many site codes look similar. It is important to make sure that the correct bin is being processed by scanning the barcode associated with the specific bin.

Be careful of the orientation in which the cassettes are stacked. All A filters should be stacked first, followed by D filters. Field blanks are stacked at the end of their corresponding week and corresponding module. For 2-3-2' boxes the field blanks are stacked at the end of week 1, and for 3-2'-2 boxes the field blanks are stacked at the end of week 3.

Be careful to place the correct sampling date cassette label on the corresponding Petri dish. Be sure to stack the filters in ascending order for feasible access to the operator unloading the carriers from the AH500 chambers and conducting post-sample weigh-in.

Make sure to handle only one cassette at a time. Having two or more cassettes open while processing filters increases the risk of filter swaps. Make sure that the filter barcode being unloaded matches that of the Lab Application. At times operators conduct incorrect filter installments.

Sometimes the loose screens stick to the filters. Try gently holding the filter and screen with one pair of forceps while separating them with another pair of forceps. Ask a lead lab tech to separate them if there is concern about tearing the filter. Sometimes filters are accidentally loaded upside-down, with the sample on the wrong side of the filter. Make sure to weigh the filter barcode side up, even if the sample is on the incorrect side. If a filter has sample on the wrong side, note this in the lab app and notify a lead lab tech.

## 4. EQUIPMENT AND SUPPLIES

- Automated Handler Chambers
- Computer with Improve Filter Processing balance application
- Forceps with ceramic tips

- Grid disks for workspace Container for used loose 1A and 4D screens
- Clean Petri dishes
- Arbor press
- Clean MTL carriers
- Ethanol
- Nitrile gloves
- Safety glass or goggles
- Laboratory coat

## 5. PROCEDURAL STEPS

Open Filter Processing lab app. Open Post-sampling select Post-weigh Chamber Prep, scan-in the bin or enter the three-letter name. The Post-weigh Chamber Prep will include site name (top of the screen), below the sites name are two or three tables; one is for 1A module (PM<sub>2.5</sub> PTFE filters), one for 4D module (PM<sub>10</sub> PTFE filters), and one for 5A /5D module if applicable (Figure 1). Each table contains the following columns, “STAT” for filter status, “SAMDAT” for sampling date, “QTR” for calendar quarter, “POS” for position number, “Chamber” for identification of which chamber unit the filter was pre-weighed through, “Barcode” that identifies the unique filter barcode, and “!” for flagging purposes.

A field blank will appear in its module column based on the cartridge position (Figure 1).

The “!” button will open a pop-up window to report sample problems (Figure 2). Filter status can be normal or terminal. Normal statuses include NM, SW, SP, SO and QD. The terminal statuses are also called “problems” and will be highlighted in red: PO, EP, NS, BI, OL, and XX (Table 1).

Figure 1. Post-Weigh Chamber Prep processing with 5A module.

Station: Post-Weigh Chamber Prep for site: <b>BYIS1 (1A, 2B, 3C, 4D, 5A)</b>																					
Module 1A							Module 4D							Module 5A							
IMDAT	QTR	POS	Pre-Weight	Chamber	Barcode	!	STAT	SAMDAT	QTR	POS	Pre-Weight	Chamber	Barcode	!	STAT	SAMDAT	QTR	POS	Pre-Weight	Chamber	Barcode
17/2021	B21	3	126.670	Sol	AS58760	!	NM	04/07/2021	B21	3	47.066	Sol	AN69872	!	NM	04/07/2021	B21	3	45.500	Sol	AR37944
0/2021	B21	4	165.606	Sol	AS58757	!	NM	04/10/2021	B21	4	43.007	Sol	AR37970	!	NM	04/10/2021	B21	4	45.742	Sol	AR38055
3/2021	B21	5	128.800	Sol	AS58758	!	NM	04/13/2021	B21	5	47.480	Sol	AR37947	!	NM	04/13/2021	B21	5	44.475	Sol	AR38053
6/2021	B21	6	132.931	Sol	AS58765	!	NM	04/16/2021	B21	6	40.137	Sol	AR38048	!	NM	04/16/2021	B21	6	47.643	Sol	AN69871
9/2021	B21	7	111.117	Sol	AS58947	!	NM	04/19/2021	B21	7	50.632	Sol	AN69988	!	NM	04/19/2021	B21	7	48.540	Sol	AN69870
2/2021	B21	8	119.898	Sol	AS58946	!	NM	04/22/2021	B21	8	51.711	Sol	AN69985	!	NM	04/22/2021	B21	8	49.344	Sol	AR38046
5/2021	B21	9	108.900	Sol	AS58945	!	NM	04/25/2021	B21	9	45.220	Sol	AR40965	!	NM	04/25/2021	B21	9	42.806	Sol	AR40973

Figure 2. Post-Weigh Chamber Prep processing reporting problems.

PROBLEMS FOR LOG ENTRY 2/24/2021 MODULE 1A

for site: **HEGL1 (1A, 2B, 3C, 4D, 5C)**

Module 4D

STAT	SAMDAT	QTR	POS	Pre-Weight	Chamber	Barcode	!
NM	02/24/2021	A21	19	55.106	Sol	AR40122	!
NM	02/27/2021	A21	20	45.791	Sol	AR36666	!
NM	03/02/2021	A21	21	43.893	Sol	AR36671	!
NM	03/05/2021	A21	22	44.658	Sol	AR36672	!
NM	03/08/2021	A21	23	42.826	Sol	AR36673	!
NM	03/11/2021	A21	24	44.328	Sol	AR36723	!
NM	03/14/2021	A21	25	47.868	Sol	AR36656	!

SHOW COMMENTS

EXIT

Table 1. Filter statuses.

NM	Normal
QD	Questionable Data, process as Normal
PO	Power Outage
EP	Equipment Problem
NS	No Sample
BI	Bad Install
OL	Offline
XX	Destroyed/No filter
SW	Swapped Sample Dates, process as Normal
SP	Field Blank/ Sample Swap, process as Normal
SO	Still Out

## 5.1 Unloading and Processing PTFE Filters

1. The lab app will display all the sampling dates within a bin; however only remove the 1A from the Week 1 bag. Remove the red caps from the 1A cartridges and place them in the Week 1 bag. All red caps removed during the post-sample weighing should go into the Week 1 bag to simplify the processing of clean filters in cartridge preparation and pre-sample weigh in stations.
2. Remove the label from the first sampled cassette in the 1A cartridge and place it on a clean Petri dish. The first sampled position is position one located on the bottom right-hand of the cartridge. All filters must be unloaded and weighed regardless of status.
3. Open the first sampled cassette with the arbor press. Overturn the cassette bottom over the grid disks. There should be a loose screen and a filter in each cassette

- bottom. Remove the loose screen and place it in the labeled container for used screens. If the screen sticks to the filter, try holding the filter with one set of forceps while trying to separate the two with another pair of forceps. If there is concern about ripping the filter, ask a lead lab tech to separate them. Note: only open one sampled cassette at a time.
- a. Make sure to orient the filter so that it rests on the grid disk sample-side up. The filter will be sample-side up when it comes out of the cassette bottom. Note that typically the sample is on the side of the filter with a legible alphanumeric code on the outer ring. This is the proper orientation. Sometimes a filter is loaded upside-down. It is important to note this in the lab app, and to weigh the filter to where the alphanumeric code is legible and matrix code is visible.
4. Remove the first 1A Filter from its cassette and load it into a clean Carrier with the sample side faced up. Make sure that the filter barcode matches the corresponding filter in the LabApp. If the barcode does not match immediately contact a lead lab tech. The alphanumeric code and Filter Barcode should be legible and right-side up. Transfer the corresponding Cassette Sticker to the top of a clean unused Petri dish. Place the Petri dish with the sticker-side faced down.
  5. Closely inspect each filter. Filters can have a variety of problems, all of which must be reported in the lab app. The standard procedure for reporting filter problems involves reporting the problem in the lab app see a-l below for further details. Click on the “!” button for the correct module and sample date.
    - a. Hole: refers to existing rips or holes (filter was damaged prior to current station), then select a hole size, pinholes are the size of a needle or smaller. Large holes are anything bigger than a pinhole. Next select hole location, middle of the filter or the outer edge. Notify a lead lab tech if there is a large hole and the filter status is valid.
    - b. Hole at download: the filter was damaged at the current station. Select, a hole size. Small is the size of the tip of a pinhole. Next select a location. Notify a lead lab tech if was damaged by a large hole.
    - c. Dropped: If a filter is dropped on the counter or on the floor, it should be reported on the lab app. Indicate whether it fell sample side down or sample side up. Make sure to select both where the sample fell and the sampled side.
    - d. Small particles (A filter only): select if visible particles on the filters.
    - e. Insect/Large particles: select if bugs or large particles are visible. If present on A filter notify lead lab tech immediately. If present on D filter, then remove the bug or large particle without damaging filter prior to weighing, ask lead lab tech for help if necessary.
    - f. Scratches/Uneven sample: select if specks, nonhomogeneous, or a patterned sample (on A's only): The color of any speck on a filter should also be noted

- (usually white or black). Note if there are multiple specks.
- g. Screen: select **Double** if more than one screen present, select **Missing** if no screen present, and select **Upside Down** if screen was loaded on the wrong side.
  - h. Upside down filter: select if the sample is on the side without the alphanumeric code. If weighed through the chamber, ensure that the alphanumeric code is facing upwards when placed on the carrier.
  - i. Anodized Dust (D filters only): Anodized dust looks like wispy dark specks on the filter.
  - j. Peeling/Flaking: if sample is uneven due to sample peeling or flaking, notify lead lab tech. Peeling will typically occur at the edge of a filter. Sample loss due to flaking occurs when sample is dry.
  - k. Water spots: notify lead lab tech if water spots are present and enter a note into the LabApp.
  - l. Finally, if there is anything not listed above that is found on the filter and is abnormal, make sure to enter a detailed note.
6. Continue unloading and stacking all 1A filters for the box.
  7. Remove the first 4D Filter from its cassette and load it into a clean Carrier with the sample side faced up. The Filter Barcode should be legible and right-side up. The corresponding Cassette Sticker can be discarded.
  8. Continue for all 4D Filters for the box.
  9. If the site contains a fifth 5A or 5D module treat it exactly as its counterpart. The order of stacking will follow the 4D filters.
  10. Clean all cassette bottoms and tops using ethanol and laboratory wipes. Also make sure to clean the cartridge plate. Place all cassette bottoms in Week 1 bag.

## 5.2 Loading of PTFE Filters into MTL AH500 Chambers

1. In the end, there should be a stack of Filters in Carriers (one filter per carrier). Be vigilant that the field blank is placed at the end of the corresponding week and module type (Week 1 for 2-3-2', Week 3 for 3-2'-2). There should also be a stack of Petri dishes with the 1A Filter Cassettes stickers on them. All of these should be Cassette-sticker side faced down, with the oldest Sampling Date at the bottom and the most recent Sampling Date at the top. When complete with the box select submit and load the carriers into the corresponding chamber or holding bin.
2. Load the occupied Carriers into an empty Silo, loading Post-Weigh filters in Silos towards the right.
3. The stack of upside-down 1A Filter Petri dishes can be reverted to right side up and placed towards the front of a bin.



4. This procedure can be repeated for the subsequent sites. 1A Filter Petri dish stacks are placed front-to-back in the same order that the Sites are processed. Note this order and the number of filters for each site on the “Post-Weigh Loading Sheet” form. Ensure that the “Post-Weigh Loading Sheet” is for the correct chamber by referring to the pseudonym ‘Luna’ and ‘Sol’.
5. Continue to stack up Post-Weigh Carriers. Each Silo fits up to 100 Carriers. Do not stack the filters all the way to the top of the Silo as they can become difficult to remove. Stack each silo up to 80 carriers. Do not split the Filters / Carriers for a Site between Silos. If a complete Site will not fit, use the Silo to the left.
6. After all A and D filters have been unloaded, place the bin the Cartridge Preparation rack.