

UCD CSN Technical Information #277A

Preparation of HIPS Analysis

*Chemical Speciation Network
Air Quality Research Center
University of California, Davis*

*July 31, 2020
Version 1.1*

Prepared By: DocuSigned by: Lindsay Kline Date: 8/13/2020
B7A73C50DF23499...

Reviewed By: DocuSigned by: Jason Giacomo Date: 8/13/2020
B62B01F81613421...

Approved By: DocuSigned by: Micole Hyslop Date: 8/13/2020
BCDBAE63A95C46A...

DOCUMENT HISTORY

Date Modified	Initials	Section/s Modified	Brief Description of Modifications
4/28/2020	LMK	All	Changed procedures to reflect new software for slide tray generation and analyzing samples, update figures.

TABLE OF CONTENTS

1.	PURPOSE AND APPLICABILITY	4
2.	SUMMARY OF THE METHOD.....	4
3.	CAUTIONS	4
4.	EQUIPMENT AND SUPPLIES.....	4
5.	PROCEDURE.....	4
5.1	Preparing Filters for Transferring to Slides.....	4
5.2	Generating Slide Trays.....	6
5.3	Transferring/Loading Filters to Slides	8
5.4	Unloading Filters from Slides	9
6.	REFERENCES	9

LIST OF FIGURES

Figure 1.	CSN Chain of Custody form	5
Figure 2	Build a Tray CSN.	6
Figure 3.	CSN slide tray label.....	7
Figure 4	Numbered and unnumbered slides	8

1. PURPOSE AND APPLICABILITY

The purpose of this Technical Information (TI) document is to describe the procedures used to prepare the Chemical Speciation Network (CSN) PM_{2.5} PTFE samples for HIPS analysis.

2. SUMMARY OF THE METHOD

LabVIEW is a program utilized to analyze CSN samples and field blanks, for a given month. The LabVIEW Build a Tray program is used to input filter information for each slide tray. Samples analyzed via LabVIEW are ingested into the CSN database.

3. CAUTIONS

Make sure the filter is placed in the slide so that the sampled side of the filter is facing away from the labeled slide piece.

Note any issues that may have occurred while transferring the filters (such as dropping a filter) on a status adjustment sheet.

Be sure the slide is secured tightly after the filter is transferred.

Pay close attention to the version of the Build a Tray program opened and verify it is the CSN version.

Pay close attention when scanning filters into the Build a Tray software to ensure filter information is not duplicated.

4. EQUIPMENT AND SUPPLIES

- Slide trays containing labeled slides organized by Tray and sample numbers
- Forceps
- Slide block
- Slide press
- Slide labels
- 2 x 2 Slides

5. PROCEDURE














5.1 Preparing Filters for Transferring to Slides

CSN samples must be refrigerated when they are not being transferred or analyzed. Any samples ready to be transferred into slides will be in the refrigerator in the HIPS lab (if a tray is missing then check the refrigerator in the XRF lab). Anytime you leave the HIPS lab CSN filters need to be placed back in a plastic bag and then in the refrigerator. Additionally, if you are transferring filters into slides and need to leave the lab, place the lid back on the slide tray, place the slide tray in a plastic bag and then in the refrigerator.

There will be a binder on the desk that contains a document called a Chain of Custody (COC). This document lists all the Teflon samples for a given CSN sampling month frequently referred to as a Batch # (e.g. Batch 63). Pages are numbered in the bottom right, before you being scanning/transferring please ensure the page numbers are in order, if not take the time to rearrange them in the binder (this will make tray building and transferring easier).

When first starting a batch, scanning and transferring begins at page 1 and the first sample listed in the COC. Place a flag on the COC next to the first sample and write the slide tray number down, e.g. Tray 1. If you are picking up where the last lab tech left off, you will look for a flag marking where they stopped (typically the binder will be left open to this page). The previous operator should have already placed a flag on the COC with the Tray# (if there is not a flag, please add one). The slide tray numbering will always start over at 1 for each batch. Once you know which page to begin transferring from remove the correct white Petri tray from the fridge. If the previous operator did not finish filling the slide tray (a slide tray can hold 40 filters), the partially loaded/filled slide tray will be in the fridge. Please refer to Figure 1.

Figure 1. CSN Chain of Custody form.

Analysis Request ID	Intended Sample Date	Sampling Month and Year	
	1/1/2020		
Set #	7Q		
Batch Number	40000063		
Barcode/Filter Analysis ID	Filter Type	Analysis Requested	Invalid?
Filter Analysis ID  F185748	Teflon	XRF	<input type="checkbox"/>
	220812082	Manufacturer Serial Number	
Filter Analysis ID  F185751	Teflon	XRF	<input type="checkbox"/>
Filter Analysis ID  F185754	Teflon	XRF	<input type="checkbox"/>
Filter Analysis ID  F185757	Teflon	XRF	<input type="checkbox"/>
Filter Analysis ID  F185760	Teflon	XRF	<input type="checkbox"/>
Filter Analysis ID  F186764	Teflon	GravXRF	<input type="checkbox"/>
Filter Analysis ID  F186779	Teflon	XRF	<input type="checkbox"/>
Filter Analysis ID  F186782	Teflon	XRF	<input type="checkbox"/>
Filter Analysis ID  F186785	Teflon	XRF	<input type="checkbox"/>
Filter Analysis ID  F186788	Teflon	XRF	<input type="checkbox"/>
Filter Analysis ID  F186791	Teflon	XRF	<input type="checkbox"/>
Filter Analysis ID  F186794	Teflon	XRF	<input type="checkbox"/>

Tray Number T1

5.2 Generating Slide Trays

There are two versions of the “Build a Tray” software, one is for IMPROVE the other is for CSN (Chemical Speciation Network). Please ensure you are using the CSN software for creating CSN trays, you will see Chemical Speciation Network (CSN) in red in the top right corner, refer to Figure 2. If you do not see this and instead see IMPROVE in blue please click on the other open version of “Build a Tray” in the taskbar. The file is located here, *U:\SharedData\HIPStrays - DO NOT EDIT\BuildTrayApp_CSN*.

Figure 2. Build a Tray CSN.

Barcode Id	Filter ID	Filter Position	Sample Date
1	FD 1 0	Pos 1 1	Date 1
2	FD 2 0	Pos 2 1	Date 2
3	FD 3 0	Pos 3 1	Date 3
4	FD 4 0	Pos 4 1	Date 4
5	FD 5 0	Pos 5 1	Date 5
6	FD 6 0	Pos 6 1	Date 6
7	FD 7 0	Pos 7 1	Date 7
8	FD 8 0	Pos 8 1	Date 8
9	FD 9 0	Pos 9 1	Date 9
10	FD 10 0	Pos 10 1	Date 10
11	FD 11 0	Pos 11 1	Date 11
12	FD 12 0	Pos 12 1	Date 12
13	FD 13 0	Pos 13 1	Date 13
14	FD 14 0	Pos 14 1	Date 14
15	FD 15 0	Pos 15 1	Date 15
16	FD 16 0	Pos 16 1	Date 16
17	FD 17 0	Pos 17 1	Date 17
18	FD 18 0	Pos 18 1	Date 18
19	FD 19 0	Pos 19 1	Date 19
20	FD 20 0	Pos 20 1	Date 20
21	FD 21 0	Pos 21 1	Date 21
22	FD 22 0	Pos 22 1	Date 22
23	FD 23 0	Pos 23 1	Date 23
24	FD 24 0	Pos 24 1	Date 24
25	FD 25 0	Pos 25 1	Date 25
26	FD 26 0	Pos 26 1	Date 26
27	FD 27 0	Pos 27 1	Date 27
28	FD 28 0	Pos 28 1	Date 28
29	FD 29 0	Pos 29 1	Date 29
30	FD 30 0	Pos 30 1	Date 30
31	FD 31 0	Pos 31 1	Date 31
32	FD 32 0	Pos 32 1	Date 32
33	FD 33 0	Pos 33 1	Date 33
34	FD 34 0	Pos 34 1	Date 34
35	FD 35 0	Pos 35 1	Date 35
36	FD 36 0	Pos 36 1	Date 36

Once the CSN Build a Tray software is open some fields will auto-populate while others will need to be filled in by the operator. If you see a tray in progress on the “build a tray” software please do not automatically click “create tray” until you have verified the tray is finished (meaning it contains 40 filters). A typical slide tray will contain 40 filters, there are special circumstances where this can change (such as the end of a batch or filters that need to be rescanned for some reason).

1. Fill in the “Sampling Month” field with the correct month and year. This information is located on the COC forms in the binder. Refer to Figure 1 CSN Chain of Custody form.
2. Fill in your initials in the “USER” field.
3. The “New Tray Number” field will auto-populate and this is referred to as the LabVIEW tray number. It is important to note this field will always increase by 1 (it does not start over with a new batch).
4. The database field should always be set to “Production” this will auto-populate (however can be changed, for routine tray building leave on “Production”).

5. Locate the first filter to be transferred in the chain of custody, which is organized by Petri tray number, written in red at the top of each page. Remove this white Petri tray from the fridge. Note: if the last operator did not complete all 40 filters in the slide tray, you will also grab the slide tray from the refrigerator (the slide tray will typically be placed in a sealed plastic bag with the white Petri tray).
6. Select the first available filter for transferring from the white Petri tray (filters waiting to be transferred will have their barcode label pointing to the left). The Petri slide contains a barcode label for scanning and has a code starting with an F followed by six numbers (e.g. F123456). Match this barcode ID to the chain of custody form. The filter itself has a manufacturer serial number printed on the membrane, verify this nine-digit number matches the chain of custody as well (e.g. 220123456).
7. Before you begin scanning, ensure the cursor is in the “Barcode ID” box for position #1. Once the Barcode ID and manufacturer serial number have been verified you can scan the barcode into the Build a Tray software using the handheld barcode scanner on the table.
8. Verify the Barcode ID on the Build a Tray software matches that barcode ID you scanned, then transfer the filter into a slide. Refer to section 5.3 Transferring filters to slides for step-by-step procedure.
9. Place the sandwiched filter into the correct position in the slide tray, ensure the red sharpie number is visible in the top right-hand corner. Place the empty Petri slide back in the Petri tray, with the barcode pointing to the right (this signifies the Petri slide is empty).
10. Repeat steps 6-9 until the slide tray is full. A slide tray can hold 40 filters but may have less than 40. Empty slots are permissible in a slide tray provided the empties are in consecutive order. For example, if a tray contains 30 filters, the last 10 slots are allowed to remain empty.
11. Once you have finished scanning all filters for a slide tray fill out a slide tray label, Figure 3 CSN Slide Tray Label. This label contains the following, CSN batch number, the slide tray number (which is the same number written on the post-it flag), and the LabVIEW tray number (from the Build a Tray software), and place this label on the front of the slide tray cover, over any preexisting label.

Figure 3. CSN slide tray label.

CSN Batch: 63
Slide tray number: 1
LabVIEW Tray Number: 45

12. Click the green “Create Tray” button on the Build a Tray software and when prompted “Are you ready to create a new tray?” select YES. The tray will be

sent to a spreadsheet that is later used for analyzing the samples. The Build a Tray software is now ready for the next tray to be built.

13. Place the completed slide tray in a sealed plastic bag and place in the refrigerator.
14. Repeat steps 1-13 to build additional slide trays.

5.3 Transferring/Loading Filters to Slides

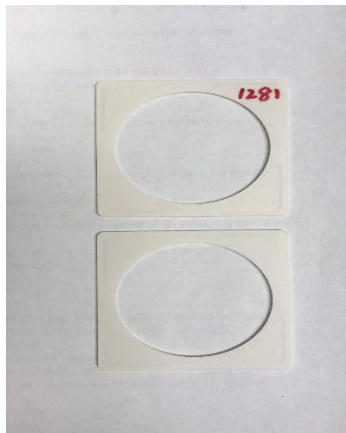
Note it is important to work with one filter at a time to prevent filter swaps. Notify the lab supervisor of any issues. Refer to section 5.2 Generating slide tray for step-by-step procedure on using the tray building software.

For each filter, verify the BarcodeID and the manufacturer number with those listed in the COC. Check the filter for any anomalies and record the filter integrity observations on the filter anomaly form.

Scan the barcode on the Petri slide label using the handheld scanner and make sure this barcode ID has appeared on the computer in the correct position, and that the cursor has now moved to the next row.

Slides are numbered 1-1400, in the upper right-hand corner, see Figure 4 below. Place the slide in the press with the number face down. Then, using forceps, pick up the filter by the support ring and transfer the filter to the slide with the deposit face up.

Figure 4. Numbered and unnumbered slides.



Next, place an unmarked slide on top of the filter and sandwich the filters using the slide press. Carefully lift the slide by the outer edge and make sure the slides are closed. If the slides are not fully closed then use the slide opener to gently open the slides and reseat the filter. Use the slide press to sandwich the filters.

Once the filter is closed, place the slide in the correct slot in the slide tray with the number facing forward. Continue to transfer the filters until the slide tray is full.

When a slide tray is full, click the green “Create Tray” button and when prompted “Are you ready to create a new tray?” select **YES**. This will save the tray you just created and the program is now ready to build the next tray.

Store the completed slide tray in a plastic bag in the refrigerator and move on to the next one.

Once the Petri tray is empty, put it back in its plastic bag with its inventory sheet and store in a Bankers box.

5.4 Unloading Filters from Slides

Follow the chain of custody and unload each sample to the original Petri slide. Verify the manufacturer number and the BarcodeID. Place the slide sample side up on the slide opener and carefully separate the slides. Then place the filter sample side up on the Petri slide. Place the labeled slide back in the slide tray. Note filter anomalies on the anomaly form; be as detailed as possible. Continue unloading the filters and place the completed tray back into the refrigerator.

6. REFERENCES

UCD CSN SOP #277: Optical Absorption Analysis of PM_{2.5} Samples