**DRI STANDARD OPERATING PROCEDURE**

# IMPROVE Sample Shipping, Receiving And Chain-of-Custody

**DRI SOP #2-111r6**
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## 1.0 GENERAL DISCUSSION

## 1.1 Purpose of Procedure

This SOP outlines the procedures and records to ensure an orderly and well-documented Chain-of-Custody for shipping and receiving of pre-fired quartz fiber filters. For the IMPROVE program, quartz fiber filters are pre-fired to remove organic vapors, sealed, and sent to UC Davis for sampling. Exposed filters are received from UC Davis for temporary storage, Multiwavelength Thermal/Optical Carbon Analysis, and long-term refrigerated storage.

## 1.2 Measurement Principle

(Not applicable)

## 1.3 Measurement Interferences and Their Minimization

(Not applicable)

## 1.4 Ranges and Typical Values

(Not applicable)

## 1.5 Typical Lower Quantifiable Limits, Precision, and Accuracy

(Not applicable)

## 1.6 Responsibilities of Personnel

Designated laboratory staff should read and understand this operating procedure before shipping or receiving) samples related to analysis work performed in the laboratory.

The Laboratory Manager or Carbon Supervisor is responsible for ensuring that the procedures are followed, especially the maintenance of shipping and receiving records.

## 1.7 Definitions

(Not applicable)

## 1.8 Related Procedures

DRI SOP #2-106r8 Pre-firing and Acceptance Testing of Quartz fiber Filters for Aerosol and Carbonaceous Material Sampling

DRI SOP #226-r7 DRI Model 2015 Multiwavelength Carbon Analysis (TOR/TOT) of Aerosol Filter Samples - Method IMPROVE_A

## 2.0 APPARATUS, INSTRUMENTATION, REAGENTS, AND FORMS

### 2.1 Apparatus and Instrumentation

The following items are required for shipping of filter samples from the laboratory:
- Vacuum-sealed bags
- Cardboard boxes.
- Shipping tape.

### 2.2 Reagents

(Not applicable)

### 2.3 Forms and Logbooks

The following check lists, log sheets, and receipts are maintained and filed:
- Shipping Receipts with attached filter information sheet, stored by project name.
- Shipment Receipt Log, used to check off all IMPROVE shipments returned to DRI.
- IMPROVE login binder, used to store paper login files received in shipments.
- DRI EAF IMPROVELogs login database, used to store digital login data.

## 3.0 CALIBRATION STANDARDS

(Not Applicable)

## 4.0 PROCEDURES

### 4.1 Flow Diagram

Figure 4-1 is a general flow diagram for the shipping procedure.

### 4.2 Shipping

Pre-fired quartz fiber filters in sealed containers of 100 each are placed into vacuum-sealed bags without ice packs and sent to UC Davis by overnight delivery. A transmittal sheet indicating the total number of filters, number of individual containers, and filter information is included. Shipping labels are created using the FedEx website which contains stored shipping profiles and destinations. UC Davis personnel are notified of the shipment, the tracking number, and expected arrival times.

Overnight delivery is used for transferring blank and exposed filters between laboratories. Shipments are coordinated to avoid arrival on weekends and holidays.

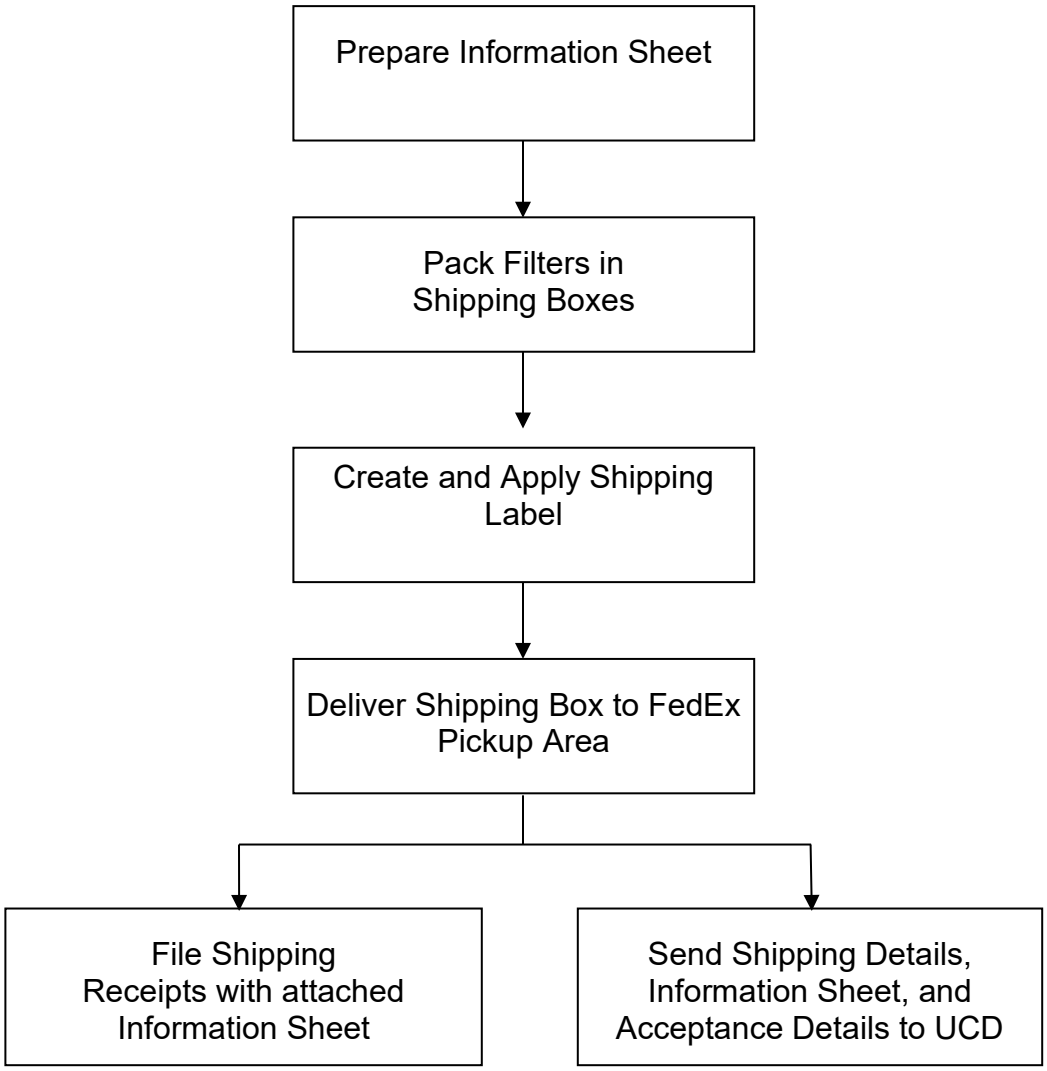

Figure 1. Flow diagram of filter handling procedures.

#### 4.2.2 Documentation

Shipping receipts are filed by project name.

### 4.3 Receiving

#### 4.3.1 Purpose

Samples are received and compared with separately transmitted analysis lists, then stored under refrigeration prior to analysis

### 4.3.2 Chain of Custody

As noted above, pre-fired quartz fiber filters in sealed containers are placed into vacuum-sealed bags with a transmittal sheet indicating the filter information and sent to UC Davis by overnight delivery. UC Davis personnel are notified of the shipment and expected arrival times.

After filters are shipped to the field for sampling and returned to UC Davis, an Excel file is received from UC Davis by email with the identification codes of samples being shipped and the expected arrival time at DRI. Upon sample receipt, the sample labels are verified with the shipping list, logged in, and placed in the laboratory refrigerator prior to analysis.

The Carbon Analysis Supervisor creates analyst lists that are transmitted to the carbon analysis technicians. Samples are removed from the laboratory refrigerator and IDs are entered into the appropriate analyzer which tracks the data thereafter.

After analysis, the sample remnants are placed in the laboratory refrigerator where they are kept until removed for placement into long-term refrigerated storage.
If the filters are scheduled to be weighed right away, take them to the weighing room and put them in the equilibration trays according to established protocols.

## 5.0 QUANTIFICATION

(Not applicable)

## 6.0 QUALITY CONTROL

The Carbon Supervisor reviews the analysis and follows up on any delayed filter shipments.

## 7.0 QUALITY ASSURANCE

(Not applicable)

## 8.0 REFERENCES

(Not applicable)

## 9.0 DOCUMENT CHANGES

12/05/2025: Document updated to be more specific to IMPROVE sample handling.