

The .csv file with your particulate matter mass and black carbon results includes the data columns shown in Table 1.

Table 1. Description of data columns in filter sample analysis results.

Parameter	Units	Description
filter_id	(-)	Filter serial identifier
pre_1_ug	(μg)	Filter mass pre-sample; first replicate measurement
pre_2_ug	(μg)	Filter mass pre-sample; second replicate measurement
pre_3_ug	(μg)	Filter mass pre-sample; third replicate measurement
pre_range_ug	(μg)	Range of the three pre-sample filter mass measurements; $\text{pre_range_ug} = \max(\text{pre_1_ug}, \text{pre_2_ug}, \text{pre_3_ug}) - \min(\text{pre_1_ug}, \text{pre_2_ug}, \text{pre_3_ug})$
post_1_ug	(μg)	Filter mass post-sample; first replicate measurement
post_2_ug	(μg)	Filter mass post-sample; second replicate measurement
post_3_ug	(μg)	Filter mass post-sample; third replicate measurement
post_range_ug	(μg)	Range of the three post-sample filter mass measurements; $\text{post_range_ug} = \max(\text{post_1_ug}, \text{post_2_ug}, \text{post_3_ug}) - \min(\text{post_1_ug}, \text{post_2_ug}, \text{post_3_ug})$
diff_ug	(μg)	Difference in filter mass between post- and pre-sample analysis; this is the mass of particulate matter accumulated on the filter; $\text{diff_ug} = \text{mean}(\text{post_1_ug}, \text{post_2_ug}, \text{post_3_ug}) - \text{mean}(\text{pre_1_ug}, \text{pre_2_ug}, \text{pre_3_ug})$
bc_atn	(-)	A measure of the black carbon content in the sample; this value represents the attenuation (<i>ATN</i>) of 880-nm light through the particulate matter sample on the filter; $\text{ATN} = 100 \times \ln(I_0/I)$, where I_0 is the intensity of 880-nm light transmitted through the filter pre-sample and I is the intensity of 880-nm light transmitted through the filter post-sample.

We suggest the following references for more information on estimating black carbon concentrations from infrared light attenuation:

Presler-Jur P, Doraiswamy P, Hammond O, Rice J. An evaluation of mass absorption cross-section for optical carbon analysis on Teflon filter media. *J Air Waste Manag Assoc.* 2017;67(11):1213-1228.
doi:[10.1080/10962247.2017.1310148](https://doi.org/10.1080/10962247.2017.1310148)

L'Orange C, Neymark G, Carter E, Volckens J. A High-throughput, Robotic System for Analysis of Aerosol Sampling Filters. *Aerosol Air Qual Res.* 2021;21:210037. doi:[10.4209/aaqr.210037](https://doi.org/10.4209/aaqr.210037)

The diameter of the sample collection area on 37-mm Measurement Technology Laboratories (MTL) polytetrafluoroethylene (PTFE; Teflon™) membrane filters (PT37P-PF03) is 29.3 mm. This diameter corresponds to a sample collection area of $6.74 \times 10^{-4} \text{ m}^2$.

Last updated: December 24, 2025