

MerPAS™ Sample Rate Assessment



MerPAS Development

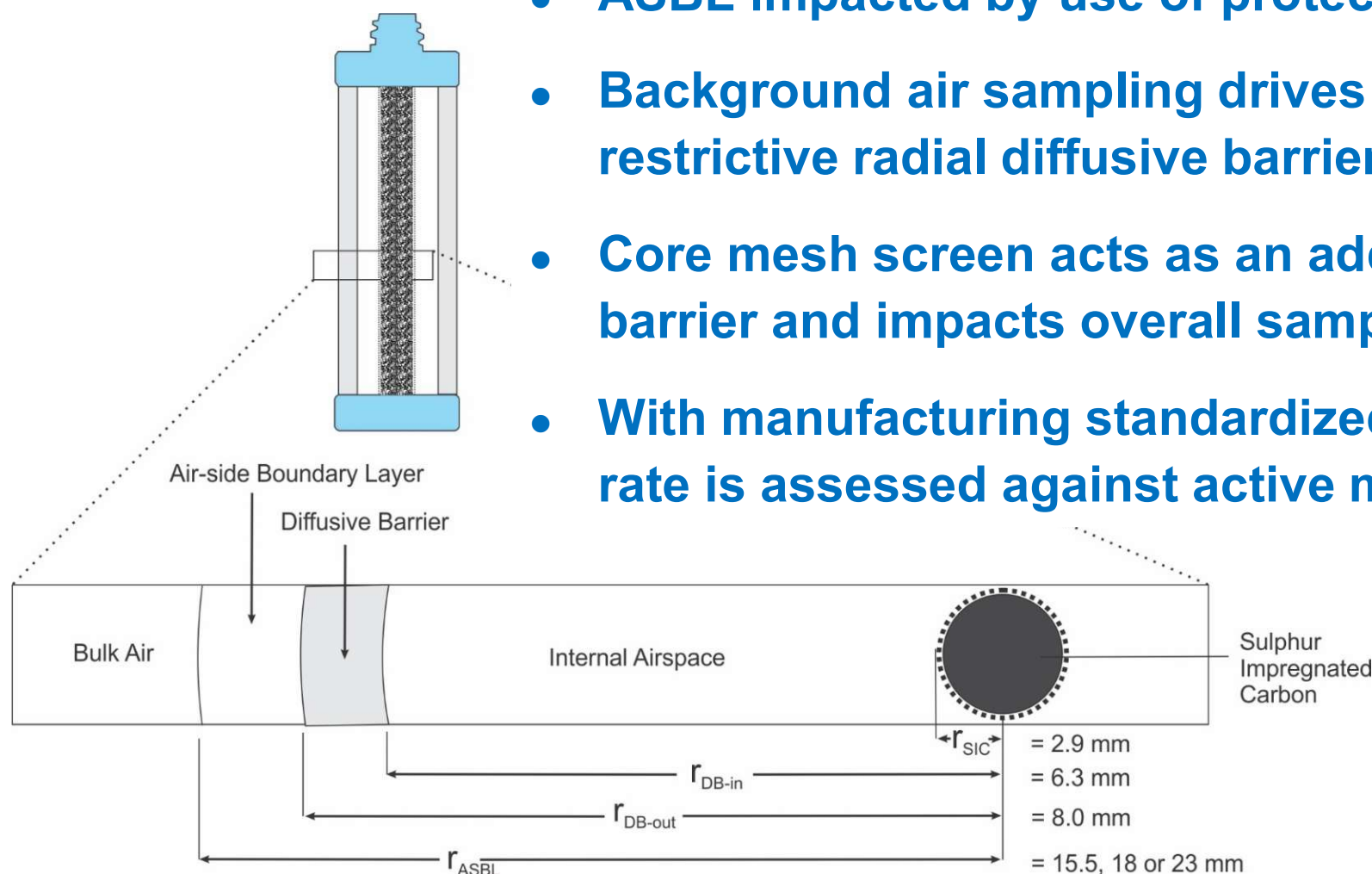
- Developed at UT-Scarborough to address need for low-cost accurate Hg sampler requiring no infrastructure to deploy
- Tested in numerous sampling situations around the world to determine reproducibility and stable sampling rate.
- Licensing agreement entered with Tekran to bring product to market
- Mass-production improved durability for handling and structural integrity of insert



*McLagan, Wania, Mitchell, et. al 2016.

Factors Affecting Uptake (Theoretical)

- ASBL impacted by use of protective jar
- Background air sampling drives use of less restrictive radial diffusive barrier
- Core mesh screen acts as an additional barrier and impacts overall sampling rate
- With manufacturing standardized, sampling rate is assessed against active measurement



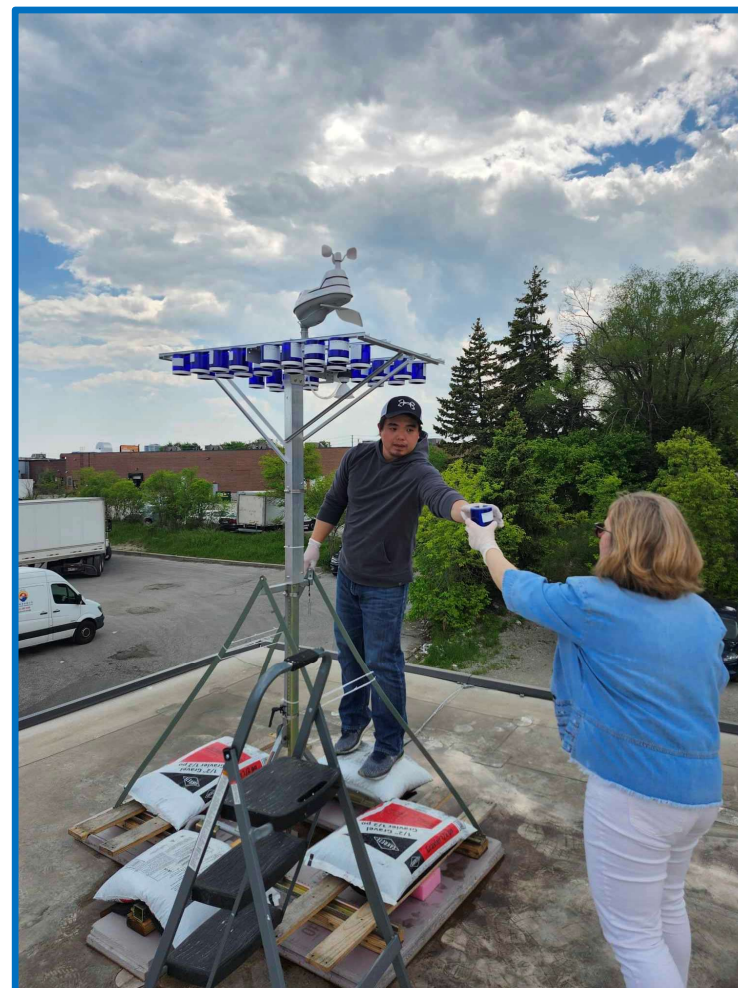
Determination of Sampling Rates

- Deployed with active 2537 for normalization of sample rate
- Triplicate sampling (minimum) collected at varying time intervals
- Each collection must also included field blank assessment – pooled blank average preferred for each experiment
- Capture of temperature and windspeed also recommended for evaluation of sampling rates
- Sample handling, 2537 QA/QC performance, and MerPAS analysis must all be in good control for inclusion of data



2024 – 2025 Long Term Exposure Study

- Tekran set up year-long urban deployment on Tekran Toronto roof
- Study included a weather station for capture of meteorological data
- Samples collected at 3, 4, 6, 9, and 12 month intervals
- Study completed in August 2025. All sample rate data has been normalized for temperature



Compiled Sampling Rates Studies

(Temp Corrected)

- Total of 9 separate studies of varying time periods (weeks to full year)
- Both MerPAS and active measurement evaluated for QA/QC
- Tekran derived sample rate equivalent to initial research (University of Toronto)

