

SAMPLING METHODS



Hi-Vol or Lo-Vol air sampling pumps



Insert for collecting **personal samples**



Perforated probe for collecting **wall cavity samples** - total spores, culturable fungi, or report both.

The Bi-Air filter cassette offers the ease of handling of a cassette; the high collection efficiency of filter media; plus a patented, innovative design providing duplicate samples.

DUPLICATE SAMPLE TRACES

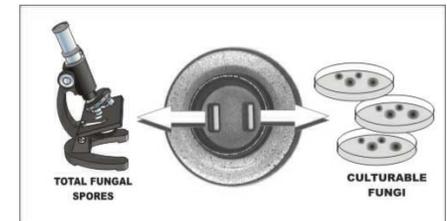
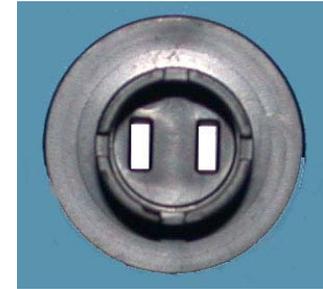
The duplicate sample traces allow pre-screening of the sample by microscopy, which identifies (1) the spore types present in the sample, and (2) those samples with elevated spore counts.

For those samples with either elevated spore counts or containing “spores of concern”, the duplicate sample trace may be:

Archived for legal purposes. Filter samples are easily archived, whereas archiving slit-impaction samples or agar samples may not be practical.

Submitted for culturing. Since spore types have been identified, media selection is easier; and, the sample may be plated on multiple media.

Submitted for QPCR analysis. The duplicate sample trace may be analyzed directly by Quantitative Polymerase Chain Reaction without complex sample transfer steps. Since QPCR analysis is relatively expensive, pre-screening the sample by microscopy provides a cost-effective approach.



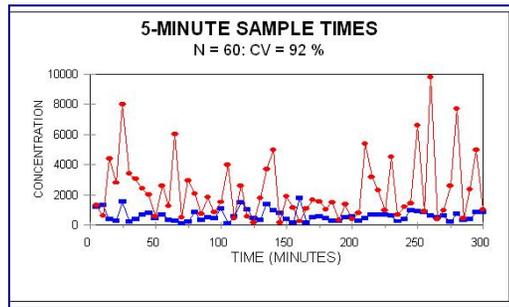
Total Spores
Culturable Fungi
QPCR Analysis
All from one sample

Reference: Spurgeon, J.; A Comparison of Replicate Field Samples Collected with the Bi-Air, Air-O-Cell, and N6 Bioaerosol Samplers. *Aerosol Science & Technology*, 41:761-769, 2007.

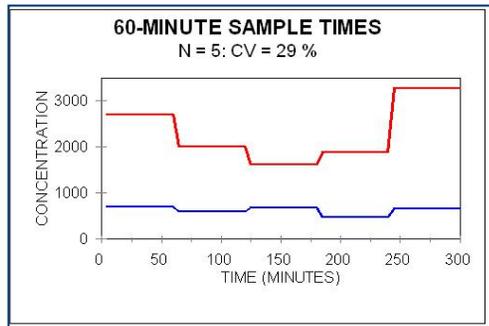
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LARGER SAMPLE SIZES OR LONGER SAMPLE TIMES?

Example distributions of control and contaminant airborne spores



Twelve 5-minute samples are required to detect a 3-fold difference in concentrations.

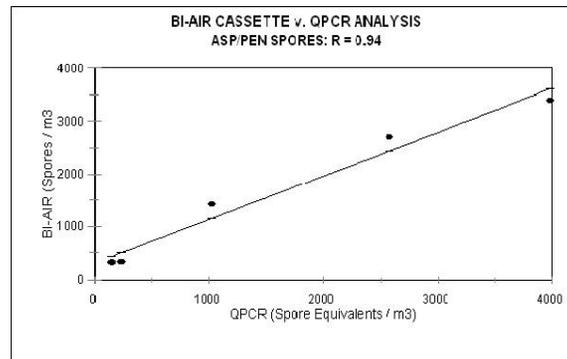


Three 60-minute samples can detect a 3-fold difference in spore concentrations

With the Bi-Air filter cassette, sample times can range from 10 minutes to 8 hours, or longer – true TWA samples. The longer sampling time results in a better estimate of the average concentration, less variability in the data, and fewer false negatives or false positives.

QPCR ANALYSIS WITH THE

BI-AIR CASSETTE



This graph illustrates the correlation between microscopic analysis and QPCR analysis performed directly on filter samples. Samples were collected on MCE filters using the Bi-Air cassette.

QPCR is a rapid method of analysis, and may be useful when fungal species need to be identified without the delay associated with culturable methods.

The Bi-Air filter cassette is especially useful for sampling in critical environments such as health care facilities. Areas such as Intensive Care Units typically contain low concentrations of airborne spores which require TWA samples for reliable detection.

If spores of concern are detected by microscopy, the duplicate Bi-Air sample may be submitted for rapid identification by QPCR.

BI-AIR PERFORMANCE

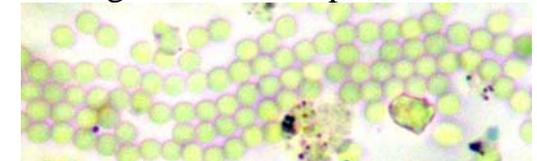
Asp/Pen spore concentrations N = 4 for each example

The filter media retains about twice as many small *Asp/Pen* spores compared to popular slit-impactor samplers; but the low airflow rate and isoaxial design of the Bi-Air also improves the retention of large, smooth spores (*Chaetomium*) and spore clusters.

Single *Asp/Pen* spores & small chains dominant

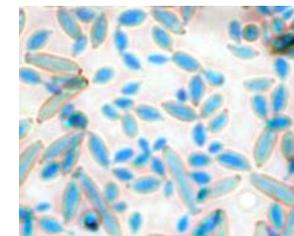
Bi-Air	Slit-Impactor	Ratio
11,900	5,800	2.1

Large clusters of spores dominant



Bi-Air	Slit-Impactor	Ratio
1,931,000	36,300	53.2

What the laboratory doesn't see



Small *Asp/Pen* like spores less than 2 um in size are often present in filter samples, but absent in slit-impactor samples