

## ANDERSEN VIABLE IMPACTOR TECHNICAL BULLETIN

### BACKGROUND

The Andersen sampler is used to collect viable samples of airborne bacteria and fungal spores. The samples can act as a measure of the number of bacteria or fungal spores in the air at a specific location and time. The sampler works through impaction in which air is drawn through a sampling head with 400 small holes at constant rate (usually 28.3 L/min) for a known period of time. Before sampling a media plate is placed inside the sampling head and as air is pulled through the holes heavier particles such as bacteria and fungal spore's impact on the agar surface and stick there. The air continues through the sampler and into the pump. After sampling the plate can be removed for culturing.

### Equipment

Air Pump  
Andersen sampler  
Isopropyl Alcohol and cotton swabs or Alcohol wipes  
¼ inch Plastic Tubing  
Media plates

### Sampling

1. Securely attach one end of the tubing to the air intake of the air pump and the other end to the outtake of the Andersen sampler. The air intake and outtake should both be around 1 inch in length and project out from the Anderson and Pump respectively. The tubing should fit securely around each creating an air tight seal.
2. Remove the hooks from the sampler and separate the top and bottom sections of the sampler head. Wipe the middle piece (400 holes) down with an alcohol wipe or alcohol and cotton swabs.
3. Place the media plate on the bottom section of the sampler. Make sure the plate is centered on top of the three small pillars located on the bottom of the sampler and the media plate lid is removed.
4. Replace the top half of the sampling head and make sure the three hooks are securely in place preventing any movement. Be sure to check that the seal which runs between the top and bottom half of the sampler is airtight.
5. Now turn the pump on and sample for the desired volume of air. After the sample is taken remove the media plate and use either parafilm or tape to keep it closed. Store plates media side up for shipment and be sure to keep samples cold but not freezing with an ice pack.

### Sampling Location and Time

Samples should be taken in suspected contamination areas, non contaminated areas, and outdoors for comparison. Generally only one or two outdoors samples need to be taken, usually at the

beginning or end of sampling. If sampling takes place for longer periods of time then more outdoors samples may be required. The duration of each sample is dependent on the environment and conditions being sampled under. For a very dusty or dirty indoor environment or outdoors a 1 min sample at 28.3 L/min is generally sufficient. In a normal clean office 4-5 mins at 28.3 L/min is usually sufficient.

## Media

|                    |  |
|--------------------|--|
| MEA                | Used for a broad spectrum of fungal species.                                       |
| TSA                | Used for a broad spectrum of bacterial species.                                    |
| BLOOD AGAR         | Used for a broad spectrum of bacterial species including <i>Staphylococcus</i> sp. |
| DG-18              | Used for isolation of xerophilic fungi.  |
| BCYE & BCYE w/DGVP | Used for isolation of <i>Legionella</i> species.                                   |
| Cellulose          | Used for isolation of <i>Stachybotrys</i> sp.                                      |

## Pros and Cons

Andersen sampling is a viable technique and thus allows for culturing and species identification that is often not possible with non-viable techniques. This is often very useful as it allows for more accurate identification of many genera such as *Aspergillus* and *Penicillium*. The drawbacks of viable sampling and Andersen sampling by extension is that the spores must be alive and capable of germinating on the culture media used. While many species are able to survive and germinate others are unable to and thus would be missed by this technique. These non viable spores are often still capable of eliciting an allergic response the same as viable spores. Furthermore it is incapable of detecting airborne hyphal fragments which could also potentially contain allergens capable of producing a response.

## References

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