Zefon Z-A6 Impactor Operating Manual

Viable Microbial Particle Sampler

www.zefon.com

800-282-0073

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INTRODUCTION

The microbial content of air has been an area of increasing concern. An EPA report found that Indoor AirQuality (IAQ) problems cost businesses $60 billion annually and since most people spend the majority of their time indoors, in fact Americans spend 90% of their time indoors, it is of enormous concern.

Microbial concerns for IAQ have been demonstrated in numerous high profile cases. One the first high profile cases was the fatal *Legionella* outbreak in 1976 at an American Legion convention. Increasing awareness, health care concerns, and legal liabilities have thrust IAQ into one of the leading environmental issues.

Biological aerosols are defined as viable solid or liquid particles in the air. These can range in size from 0.1 micron in diameter viruses to fungal spores of 100 microns or more in diameter. These organisms may occur as single unattached organisms or as multiple aggregates.

There are two constraints of bioaerosol samplers for useable results. First the organism must be separated from air to conduct a viable assay and second, the organism must be viable and capable of reproducing to provide useful results.

SINGLE STAGE VIABLE PARTICLE SAMPLER

The *Zefon* Z-A6 viable particle sampler is an aluminum device held together by three spring clamps and sealed with two o-ring gaskets. The unit consists of an inlet cone, a jet classification stage, and a base plate. The impactor stage contains 400 precision drilled holes. When air is drawn through the sampler, multiple jets of air direct any airborne particles toward the surface of the agar collection surface.

REQUIRED SAMPLING EQUIPMENT

- ***Zefon*-Z-A6 Sampler**
- **Vacuum Pump**
- **Rotameter**
- **Flexible Tubing**
- **Sampling Media**
- **Isopropyl Alcohol**
- **Hand Sanitizer**

SAMPLING METHODS

1. Clean hands with a hand sanitizer and at any point where cross contamination is possible.
2. Connect the flexible tubing from the pump to the male connector on the sampler.
3. Prior to sampling, turn on the vacuum pump and calibrate it to 1 ACFM (28.3 liters per minute) using a rotameter.
4. After calibration wipe all surfaces of the sampler with isopropyl alcohol using a sterile gauze pad.
5. With the sampler sanitized and the inlet cone and jet classification stage removed, place an agar plate (with the appropriate media) with its lid removed on the base of the sampler so the plate rests on the three raised metal pins. Immediately cover the plate with the jet classification stage and the inlet cone. Secure the device with the three springs clamps and visually check to be sure of a good seal.
6. Turn on the vacuum pump for 2 to 5 minutes (contact your laboratory if you are unsure of the best length of time to utilize). Air is drawn through the cone and passes into the jet classification stage where it is accelerated and passes through small openings and is then impacted onto the agar plate. The exhaust air is then carried through the outlet on the base and into the vacuum hose attached to the pump.
7. After sampling, unhook the three clamps and remove the agar plate. Quickly replace the agar plate cover and label the back of the plate with the appropriate sample identification information. Seal the plate in a zip lock bag and place it in an ice chest with blue ice.
8. Before taking another sample be sure that your hands and the sampling device have again been sanitized.

QUALITY CONTROL

The vacuum pump should be calibrated with a rotameter prior to use and recalibrated when non-standard temperatures or pressures are encountered. A blank unexposed plate should also be analyzed with each sampling event as a negative control. Outdoor samples should also be collected for comparisons to indoor samples. An indoor control sample should be taken from non-complaint areas. Never use sampling media that has expired, has visible cracks or has been contaminated.

SAMPLE MEDIA

Any medium in a standard-size petri dish (15x100mm) may be used with the *Zefon* Z-A6. The following media are typically used for most bioaerosol investigations. Customized media may be employed for specific applications.

Bacteria: Tryptic Soy Agar (TSA) and Tryptic Soy Agar with 5% Sheep Blood, or Blood Agar (BAP) are commonly accepted, broad-spectrum media for the isolation of bacteria including thermophilic actinomycetes.

Fungi: Potato Dextrose Agar (PDA), Malt Extract Agar (MEA), and Dichloran Glycerol 18 Agar (DG-18) are commonly accepted, broad-spectrum media for the isolation of fungi. Potato Dextrose Agar typically promotes sporulation of most xerophilic fungi, and is favored for more rapid identification of isolates.

SAMPLE SUBMISSION

It is essential to insure sample integrity from initial collection to final reporting. This includes the ability to trace possession of the sample from the collection point to receipt at the laboratory. All samples submitted to a laboratory should be accompanied by a completed Chain of Custody form. This form contains fields for reporting, sample identification, analyses requested, and other important information.

All individual sample containers should be properly labeled with a sample identification on the bottom of the agar plate. Each sample should also be sealed in a zip lock bag or other suitable container to prevent any contamination during shipping. Samples should be stored and shipped in a container such as a cooler that has blue ice to preserve sample integrity and should be received by the laboratory within 24 hours.

LABORATORY ANALYSIS

If samples are to be sent to a commercial laboratory it is strongly recommended that a laboratory that has been tested by the American Industrial Hygiene Association's (AIHA) EMPAT program be utilized.

SUPPLIES & MAINTENANCE KITS

Call *Zefon* International, Inc. at 800-282-0073 or 727-327-5449 to order supplies.

Zefon Z-A6 Refurbish Kit	$20.00	Gasket Seals & End Caps
Zefon Z-A6 Spring Kit	$75.00	Set of Three Springs