SKC

**Operating Instructions**

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# Gelatin Filters
## Cat. Nos. 225-9551 and 225-9552

SKC Gelatin Filters are designed for the detection and analysis of airborne microbes. Gelatin filters not only retain bacteria and molds but are also effective for the collection of viruses. Used to quantitatively collect airborne microorganisms, gelatin filters have an inherent high moisture content that helps to maintain viability of stress-sensitive microorganisms for sampling periods up to 30 minutes. The gelatin material can be dissolved easily in a buffer or agar medium for easy detection of bacteria and viruses.

## Performance Profile

| | |
|---|---|
| Material | Water-soluble gelatin |
| Pore Size | While having a nominal pore size of 3.0 µm, a higher capture efficiency of sub-micron particles can be expected due to the separations that occur on the surface and within the filter. It is through inertial impaction and diffusional interception that these filters can remove particles much smaller than 3.0 µm. |
| Diameter | 25 or 37 mm |
| Thickness | Approximately 250 µm |
| Thermal Resistance | Maximum 140 F (60 C) |
| Residual Dampness Content | 46 to 49% |
| Max. Temperature and Humidity | Maximum room temperature is 86 F (30 C); maximum relative humidity is 85% |
| Sterilization | Presterilized by gamma radiation |
| Max. Sampling Time | 30 minutes (*see Sampling Parameters on page 2*) |
| Storage | Storage at 39.2 to 46.4 F (4 to 8 C) is recommended for gelatin filters.<br>**Caution:** Do not store gelatin filters below 39.2 F (4 C). Condensation during thawing will dissolve filter. Avoid exposing filters to moisture, chemical vapors, and extreme temperatures. |
| Shelf-life | Check expiration date on packaging. |
| Analysis | Direct method or indirect method (*see pages 3 and 4*) |

## Sampling Parameters

**Max. sampling time:** 30 minutes
**Max. recommended air face velocity (through filter):** 0.4 meters/second (m/sec)
Prolonged sampling time and high air velocity may destroy gelatin pores leading to a decrease in collection efficiency of gelatin filters.

**Note:** *Air velocities nearer 0.4 m/sec require shorter sampling times. Conversely, lower air velocities allow longer sampling times.*

**Face velocity for specific samplers/filter diameters:**

- **IOM Sampler** with 25-mm filter at 2 L/min flow rate = air face velocity of 0.08 m/sec
- **Button Sampler** with 25-mm filter at 4 L/min flow rate = air face velocity of 0.16 m/sec
- **37-mm filter** at:
  - 2 L/min flow rate = air face velocity of 0.035 m/sec
  - 4 L/min flow rate = air face velocity of 0.07 m/sec
  - 10 L/min flow rate = air face velocity of 0.17 m/sec

## Operation

**Filter Handling Guidelines**

- Gelatin filters are brittle; handle filters carefully.
- Do not touch filters with fingers or foreign objects.
- Use forceps to handle filters.
- Do not grip filters too tightly with forceps; this will cause breakage.
- Avoid bending filters.
- Keep pocket on filter until ready to load into a cassette. *See Loading a Gelatin Filter into a Cassette.*

**Loading a Gelatin Filter into a Cassette**

***Note:*** *Load the filter only under sterile conditions. Follow Filter Handling Guidelines.*

1. Disassemble the cassette and carefully let the gelatin filter slide out of its pocket into the cassette.
2. Use forceps to aid in positioning the filter.
3. Reassemble the cassette.
4. Use flexible tubing to connect the outlet of the cassette to the inlet of an air sample pump capable of the desired flow rate.
5. Sample for the appropriate sampling period up to 30 minutes (*see Sampling Parameters*). Sampling periods should be brief to help reduce microorganism stress.

**Handling and Shipping the Filter After Sampling**
Determine the method of analysis to be used, direct or indirect, before preparing the sample for shipment. There are two methods for shipment preparation.
**Method 1 can be used for shipping to a laboratory at a different location.**
**Method 2 should only be used if there is an on-site laboratory that can perform microbial analysis.**

**Method 1**

**Note:** This method prepares the sample for the indirect analysis method.

1. Turn off the pump.
2. Disassemble the cassette and use forceps to gently remove the filter. Place it in 10 ml of sterile water. (10 ml is recommended. Add more water, if needed.)
3. Once the filter dissolves, pour the solution in a water-tight container or tube.
4. Seal the container and ship to a laboratory for analysis. *See Analysis & Additional Application Notes.*

**Caution:** Avoid extreme temperatures during storage and shipping.

**Method 2**

***Note: Use this method only if there is an on-site laboratory.*** *Determine the appropriate agar before collecting the sample. These steps prepare the sample for the direct analysis method.*

1. Turn off the pump.
2. Open the cassette.
3. Place a prepared agar-filled petri dish base over the filter in the cassette until they are touching. The gelatin filter will adhere to the agar surface.
4. Carefully lift the agar plate base with the gelatin filter.
5. Immediately cover the petri dish base with its lid.
6. The gelatin filter will dissolve due to the moisture in the agar culture medium allowing the microbes to come into direct contact with the nutrient medium. The plates are incubated and the colonies counted. *See Analysis & Additional Application Notes.*

## Analysis & Additional Application Notes

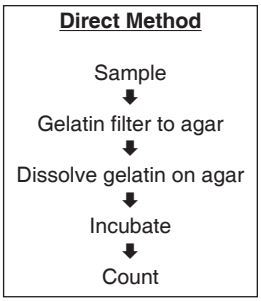
**Direct Method**

***Note:*** *This method is not recommended for virus aerosols.*

1. After transferring the filter to the culture medium, incubate it in an incubator with the lid of the petri dish facing up.

***Note:*** *To prevent liquid from collecting on the agar surface, always use predried agar that is not freshly prepared.*

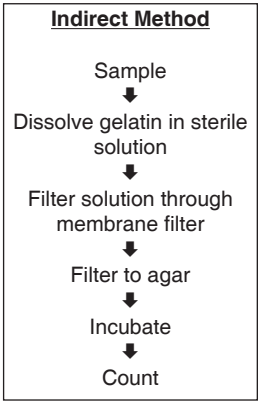
2. Choose the time, temperature, and type of culture medium suitable for the target microbes. Follow these guidelines:
   - Standard, Caso, or Plate Count Agar are suitable for determining colony count (total CFU count).
   - Sabouraud, Malt Extract, or Wort Agar can be used for detecting yeasts and molds.
   - Blood Agar is suitable for detecting pathogenic microbes causing hemolysis.
3. Count the colonies that form.



**Indirect Method**

***Dissolving Gelatin Filters After Sampling Airborne Microbes***

This method is used to prevent osmotic shock to the sampled organisms, to provide sub-samples for removal of inhibitors such as disinfectants, for dilution of the sample where high counts are expected, or to allow plating onto different nutrient media where species identification is required.




1. Dissolve the gelatin filter in sterile liquid warmed to 35 to 40 C, such as physiological saline or 0.1% peptone water.
2. Stir the solution using a sterile magnetic stirrer to accelerate filter dissolution.
3. Process the solution according to Koch's pour plate method or the membrane filtration technique.
4. Incubate samples.
5. Evaluate colonies that form.

***Note:*** *During the dissolving and stirring process (indirect method), the colony-forming units are separated into individual microbes so you will obtain a higher CFU count than with directly placing the exposed filter on a culture medium (direct method).*

**Calculation of Colony-forming Units per $m^3$**

To determine the quantity of colony-forming units per cubic meter of air ($CFU/m^3$), compare the number of colonies in relation to the volume of air originally sampled.

## Removing Disinfectants

***Note****: It is strongly recommended that you use the indirect method when analyzing samples from an area sprayed with disinfectants or where antibiotic airborne particles are present. Using this method allows the removal of the disinfectants that inhibit the growth of microbes on the culture medium. Follow this procedure:*

1. Dissolve the gelatin filter as instructed above.
2. Before Step 3, filter the resulting liquid through a 0.45-µm pore size membrane filter.
3. Add sterile water to rinse the filter.

## SKC Limited Warranty and Return Policy

SKC products are subject to the SKC Limited Warranty and Return Policy, which provides SKC's sole liability and the buyer's exclusive remedy. To view the complete SKC Limited Warranty and Return Policy, go to skcinc.com/warranty.