

\$15.00 US Dollars  
\$20.00 Canadian Dollars

**MICROBIOLOGY SAMPLING GUIDE**



**800.303.0047**

South Pasadena, CA

**800.755.1794**

Los Alamitos, CA

**310.618.0400**

Torrance, CA





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[www.LATesting.com](http://www.LATesting.com)

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520 Mission Street, South Pasadena, CA 91030

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## Air Sampling for Total Spore Counts

### AIR-O-CELL

- The Air-O-Cell™ cassette (Product ID 8715301B) is a single-use sampling device designed for the rapid collection and analysis of a wide range of airborne particles. These include fungal spores, pollen, insect parts, skin cell fragments, fibers, and other inorganic particulates.
- The cassette is designed to operate at a flow rate of 15 LPM. Lower flow rates may result in a collection loss of some spores and the accumulation of others in a non-uniform manner. Therefore, it is critical to run the sampling pumps at the manufacturer's recommended air flow rate.

#### Benefits

- Useful for initial site testing, especially if fungal growth is not visible.
- Quick and simple procedure.
- Fast turn around times available.
- Low chance of sample contamination.
- Necessary for determining allergic mold spore potential. Mold spores can cause allergies whether they are viable or non-viable

#### Disadvantages

- Fungi cannot be identified to species with this method.
- Due to the similarities in spore morphology, some spores will be grouped together, i.e., *Aspergillus* sp. and *Penicillium* sp.
- Spore viability cannot be assessed.

#### Sampling Procedure

1. Prior to sampling, calibrate your pump to 15 liters per minute via a rotameter. It is also recommended that the rotameter or sampling pump be periodically calibrated to a NIST primary standard. If using the Zefon Bio-Pump (Product ID 8706002) use the specifically designed Air-O-Cell flow indicator, a specially designed bubble tube NIST Primary calibrator (Product ID 8704200). It can not be used with any other type of pump.
2. Remove and retain tape seal covering inlet and outlet on the cassette.
3. Attach the outlet (round hole) to a standard 1/2" PVC tubing (for use with high volume pumps only).
4. Start the sampling pump and sample for an appropriate period of time (see recommendations below).
5. Remove Air-O-Cell from tubing and reseal with the original seals. Label sample.
6. Complete an LA Testing Chain of Custody (COC), available at [www.LATesting.com](http://www.LATesting.com), detailing client name and information, project name or number, sample #, description of area, and volume of air collected.
7. To reduce shipping damage, it is recommended that the Air-O-Cell be placed in a corrugated box with padding to ensure safe arrival at the laboratory.

#### Sampling Duration

- The sampling time is dependent on the density of particulate in the environment. It is important not to overload the sample, otherwise it will be impossible to accurately count the types of spores, pollen or other particulates that are present. The following list represents typical sample times to attain a sharply defined trace with good dispersion of the spores:
  1. Clean "office" or outdoors (no visible dust) = 10 minutes
  2. Indoor environment, high activity & personnel = 5 minutes
  3. Indoor environment, drywall renovation or heavy industrial dust = 1 minute.

#### Quality Control Recommendations

- An effective interpretation is based on the comparison of indoor and outdoor samples. Outdoor samples will help demonstrate whether spore amplification is occurring indoors.
- Obtain a control sample from a non-complaint area for comparison.
- Sending a blank cassette for analysis per project is a good practice.
- Flow rate is critical for accurate results. Remember to calibrate and recalibrate the pump prior to all sampling. (15 liters/minute)
- Never use cassettes that are damaged or expired.

For more information contact Zefon International at: [www.zefon.com](http://www.zefon.com).

*Air-O-Cell™ is a registered trademark of Zefon International.*



#### Air-O-Cell

50 Pack, #8715301B

List Price: **\$199.00** USD

10 Pack, #8715302

List Price: **\$55.00** USD



#### Bio-Pump Plus

#8706002

List Price:

**\$729.00**  
USD

## MoldSnap & MICRO-5

- The Zefon MoldSnap (Product ID 8715304) and the Micro5 MicroCell (Product ID 8715306) were designed to operate at a flow rate of 5 liters per minute for optimal collection efficiency. Cassettes should be stored at 50° - 80° F.
- **Do not use in temperatures below 37° F!**

### Sampling Procedures

1. Remove pin from the bottom of the MoldSnap or Micro5.
2. If using a conventional high volume pump: Simply connect one end of tubing (5 feet or less) to the bottom of the cassette.
3. If using a low volume pump such as a GilAir5: Simply attach a 1" piece of tubing to the bottom of the cassette.
4. Connect the other end of tubing to a pump pre-calibrated to a flow rate of 5 LPM.
5. Remove cap from the top of the cassette.
6. Turn pump on and take a sample for an appropriate amount of time depending on environment. (See "Sampling Duration" below.)
7. When sampling is completed, replace the pin & cap to the bottom and top of the cassette.

### Sampling Duration

- Outdoor / Indoor Clean Environments = 8-10 minutes
- Indoor (Normal Activity) = 5 minutes
- Indoor (Heavy Particulates) = 1-3 minutes
- Inner wall cavity using the Micro5 only (with optional Inner Wall Adapter, Product ID 8715901) = 1-2 minutes

## Allergenco-D

- The Allergenco-D (Product ID 8715307) was designed to operate at a flow rate of 15 liters per minute for optimal collection efficiency.

### Sampling Procedure

1. Remove seal from the bottom of the Allergenco-D.
2. Simply connect one end of tubing (5 feet or less) to the bottom of the Allergenco-D.
3. Connect the other end of tubing to a pump pre-calibrated to a flow rate of 15 LPM.
4. Remove seal from the top of the Allergenco-D.
5. Turn pump on and collect a sample for up to 10 minutes, depending on environment (See "Sampling Duration").
6. When sampling is complete, replace seals to the bottom and top of the cassette.

### Sampling Duration

- Outdoor sample 1-10 minutes
- Dust-free environment (clean office) 5-8 minutes
- Indoor environment (occupied space) 3-5 minutes
- Indoor environment (excess visible dust) 1-3 minutes
- Inner wall sample 1-5 minutes (using optional wall adapter, Product ID 8715908)



**Mold Snap**  
50 Pack, #8715304B  
List Price:  
**\$189.00**  
USD



**Gilian GilAir5R**  
#8706209  
List Price:  
**\$619.00**  
USD



**Bios Defender**  
**510-H High Flow**  
300mL/min - 30 L/min  
#8704013  
List Price:  
**\$1,350.00**  
USD

### *Tech Tip: Basic Mold Cleanup*

The key to mold control is moisture control. It is important to dry water damaged areas and items within 24-48 hours to prevent mold growth. If mold is a problem in your home, clean up the mold and get rid of the excess water or moisture. Fix leaky plumbing or other sources of water. Wash mold off hard surfaces with detergent and water, and dry completely. Absorbent materials (such as ceiling tiles & carpet) that become moldy may have to be replaced. (Source: EPA <http://www.epa.gov/mold/moldresources.html>)

## Culturable Air Sampling (Fungi or Bacteria)

### Particle Impactors (Andersen-type Samplers)

- This method of air sampling involves drawing a measured volume of air over culture media in Petri dishes. The Petri dishes are incubated in the laboratory so the organisms impacted on the plate can grow. The fungi or bacteria are counted and identified. This method commonly uses an Andersen N-6 type impactor (e.g. LA Testing VP-400 Microbial Sampler Product ID 8709001). Different agar plates are available from LA Testing, depending on the types of fungi or bacteria to be identified.

### Benefits

- Fungal cultures can determine whether the fungus is viable (alive), and allows for genus and species identification.
- Bacterial cultures provide enumeration and identification of culturable bacteria present in the air.

### Disadvantages

- Cultures take 6-10 days for the microorganisms to grow and be identified.
- Since most environmental samples contain a large number of organisms, each has to compete with others to grow on the media. As a result, fungi and bacteria present in the air may not be as well represented in culture.
- Some microbes do not grow well or at all on the culture media.
- Some microorganisms are unable to be identified, as they fail to produce key characteristics such as spores or they may not be described in the scientific literature.

### General Media Recommendations Fungi and Bacteria

- For fungal sampling, in general, we recommend Malt Extract Agar (MEA).
- If you are sampling in dry areas, the use of DG18 will help select for the growth of dry-loving fungi that may not grow on MEA agar
- Sampling for *Stachybotrys* sp. can be achieved with either Cellulose Agar (CA) or Cornmeal Agar (CMA).
- For bacterial sampling, in general, we recommend Tryptic Soy Agar (TSA) or TSA w 5% blood.
- For sampling Gram negative bacteria, we recommend MacConkey Agar (MAC)
- For all other situations, the Microbiology Department will be happy to make recommendations based on your individual sampling situation.
- Sampling supplies may be ordered at [www.LATesting.com](http://www.LATesting.com) or by calling Customer Service: 800-220-3675.

### How to Handle Microbiological Media (Agar plates)

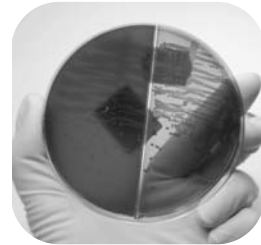
- Agar plates must be kept refrigerated or on freezer packs until ready to use.
- The plates must be allowed to warm up to room temperature before taking a sample (approx. 15 minutes).
- Do not remove the lid from the plate at anytime except during sampling.
- Seal the lid to the plate after sample collection with Parafilm or tape.
- The plates must be shipped back to LA Testing with freezer packs by OVERNIGHT PRIORITY. Refreeze and reuse the original freezer pack (this type of freezer pack is stable for 24 hours).
- Adequate packing material must be sent to protect the plates.
- Plates must not come into direct contact with the freezer pack, as the media may freeze, invalidating the tests.
- If there is any delay in sending the agar plates to LA Testing, they should be refrigerated until ready for overnight delivery.

### Recommendations

- Wear latex or nitrile gloves during sampling.
- Use 70% isopropyl alcohol to disinfect sampling device between each sample.
- Place Petri dish lid in a clean bag during sampling to reduce any cross contamination.
- Include outside samples and a field blank for control.

## Sampling Procedure

1. Allow agar plates to reach room temperature before use.
2. Attach one end of tubing to the intake of the vacuum pump and the other end to the inlet of the sampler.
3. Calibrate the flow rate of the vacuum pump:
  - a. Place an uncovered Petri dish into sampler (Do not submit this dish as a sample, discard after calibration).
  - b. Turn on pump and adjust flow until the rotameter is at 28.3 LPM (flow rate is read from the middle of bearing on the rotameter).
  - c. Remove stopper and rotameter prior to sampling.
4. Wipe all exposed surfaces of sampler with a 70% isopropyl alcohol pad and allow to air dry.
5. Place the agar plate on the sampler base so that the Petri dish rests on the three raised metal pins.
6. Remove the cover of the Petri dish and place into a clean sample bag to minimize contamination (available upon request).
7. Assemble the jet classification stage on the sampler and secure the inlet cone with the three attached clips.
8. Set timer to appropriate time depending on environmental conditions (sampling time is usually between 2-5 minutes).
9. Turn on the pump and start the timer simultaneously.
10. When the time is up, turn off the pump and disassemble sampler and place cover back onto agar plate.
11. Secure lid onto Petri dish with masking tape or Parafilm (avoid using electrical, packing, transparent and duct tape).
12. Write the sample number on the bottom of the Petri dish.
13. Record all appropriate information on the Chain of Custody.
14. Return samples with an ice pack to LA Testing for analysis.



**LA Testing  
VP-400  
Single Stage  
Microbial Sampler**  
#8709001  
List Price:  
**\$375.00 USD**



**LA Testing  
VP-400  
Basic Kit with  
E-Lite Pump**  
25 Pack, #8709003  
List Price:  
**\$459.00 USD**

### *Tech Tip: Can mold cause health problems?*

Molds are usually not a problem indoors, unless mold spores land on a wet or damp spot and begin growing. Molds have the potential to cause health problems. Molds produce allergens (substances that can cause allergic reactions), irritants, and in some cases, potentially toxic substances (mycotoxins). Inhaling or touching mold or mold spores may cause allergic reactions in sensitive individuals. Allergic responses include hay fever-type symptoms, such as sneezing, runny nose, red eyes, and skin rash (dermatitis). Allergic reactions to mold are common. They can be immediate or delayed. Molds can also cause asthma attacks in people with asthma who are allergic to mold. In addition, mold exposure can irritate the eyes, skin, nose, throat, and lungs of both mold-allergic and non-allergic people. Symptoms other than the allergic and irritant types are not commonly reported as a result of inhaling mold. Research on mold and health effects is ongoing. This brochure provides a brief overview; it does not describe all potential health effects related to mold exposure. For more detailed information consult a health professional. You may also wish to consult your state or local health department. (Source EPA Document # 402-K-02-003)

## Surface Sampling

### Direct Examination (Tape Lift, Bulk, Swab)

- A direct exam allows for the rapid determination of the presence of fungal spores as well as identifies the types of fungi.
- Direct examinations should only be used to sample visible mold growth in a contaminated area since most surfaces will have a deposit of fungal spores that are normally present in the environment.

### Benefits

- The direct exam is inexpensive and can be performed quickly.
- A useful test for determining if there is mold amplification.
- Direct sampling may reveal indoor reservoirs of spores that have not yet become airborne.

### Disadvantages

- Areas of fungal growth are often small and scattered, so they may not all be picked up. Choosing multiple sampling locations will help overcome this problem.
- Health problems related to indoor microbial growth are generally caused by the inhalation of substantial numbers of airborne spores, sometimes over a long period of time. The presence of biological materials on a particular surface may not be a direct indication of what is in the air.
- This method detects both viable and non-viable spores but cannot distinguish between them. It is advisable to combine direct exam samples with culture methods if knowing viability is important to your project.
- Tape lifts are not able to be cultured.
- If a direct examination of a swab sample is taken, a follow up by culture is possible.
- Direct examinations of dirt/soil and dust samples cannot be performed reliably because of preparation limitations.
- Fungi usually cannot be identified to species and sometimes not even to genus with this method. For example, *Aspergillus* sp. and *Penicillium* sp. are normally reported together due to the similarities in spore morphology, unless fruiting structures are present that allows for a better identification.

### Materials

#### For Tape Lift:

- We recommend using LA Testing Tape kits or Bio-Tapes (Zefon Intl) otherwise clear (transparent) Scotch or other brand tape (frosted tape obscures the spores).
- New plastic bag to hold sample(s) (provided in a tape lift kit available from LA Testing).
- Only use tape lifts on hard, flat surfaces

#### For Bulk:

- Sterile container, new plastic bag or Whirl-Pak (provided by LA Testing) to hold and transport samples.

#### For Swab:

- Sterile TransPorter swab to collect and transport samples (provided by LA Testing).

#### For all Matrices:

- Latex/nitrile gloves (also can be provided at your request).

## Sampling Procedure

### Tape-lift

1. Take a few inches of clear tape. Avoid touching the sticky side, especially the part to be used to collect the mold.
2. Wearing gloves, apply the central inch of tape to the suspect area (choose one that is free of extraneous debris). Apply light pressure to the non-adhesive side.
3. Pull tape off surface with slow, steady pressure, holding the tape edges only.
4. Apply sticky side of tape to the inside of the plastic bag (ziplock).
5. Ensure there are no folds or creases in the tape.
6. Close bag and label appropriately. (Put only one sample in each bag.)



### Bio-Tape

25 Pack, #8708325  
List Price: **\$25.00**  
USD



### Nitrile Gloves

Small #8705400  
List Price:  
**\$8.95** USD

Medium #8705401  
List Price:  
**\$8.95** USD

Large #8705402  
List Price:  
**\$8.95** USD

X-Large #8705403  
List Price:  
**\$8.95** USD

## **Bulk**

1. Wearing latex gloves remove a small piece of the suspect material (1 x 1 inch piece is more than sufficient).
2. Place piece inside clean sterile container or new plastic bag (ziplock).
3. Close bag or cap container and label appropriately.

## **Swab**

1. Wearing gloves, remove swab from packaging material.
2. Remove plug from media tube.
3. Swab the desired area thoroughly, rolling the swab lightly back and forth over sampling area.
4. Insert the swab in the tube, firmly close cap, and label appropriately.
5. Complete an LA Testing Chain of Custody (COC), available on our website ([www.LATesting.com](http://www.LATesting.com)), detailing client name and information, project name or number, sample #, and a description of the area.

## **Quality Control Recommendations**

### *For Tape Lift:*

- Use clear tape--not frosted, electrical, duct, or packing tape.
- Do not fold tape onto itself.
- Stick tape on the inside of the plastic bag only.
- Please do not send tape on slides or cover slips. They may arrive broken making the sample difficult to analyze.

### *For Bulk:*

- Send a representative portion of the sample, if large. This prevents over-handling of the sample and contamination. If analysis of a specific portion of sample is required, please note area(s) or take a tape lift of area.

### *For Swab:*

- For quantitative culture reporting, the area swabbed needs to be entered on the chain of custody.

## **Culturable Surface Sampling (Bulk or Swab)**

### **Benefits**

- The sampling method is inexpensive and surfaces can be quickly sampled.
- A useful test for initial site sampling.
- Species level identification possible.
- Viability of fungi is determined.

### **Disadvantages**

- Areas of fungal growth are often small and scattered, so they may not all be picked up. Multiple sample locations will help overcome this problem.
- Health problems related to indoor microbial growth are generally caused by the inhalation of substantial numbers of airborne spores, sometimes over a long period of time. The presence of biological materials on a particular surface may not be a direct indication of what is in the air.
- This method detects only viable spores and hyphae but cannot detect nonviable or difficult to culture fungi. It is advisable to combine direct exam samples with culture methods if knowing the presence of non-viable fungi is important to your project.
- Cultures can not distinguish between spores, hyphae and other fungal cells; the results are reported as colony forming units.

### **Materials Required**

- Latex/nitrile gloves



## Sampling Procedure

### Swab Sampling

1. Obtain sterile 1 mL Butterfield's Solution swab to collect and transport samples (provided by LA Testing).
2. Wearing gloves, remove swab from packaging material.
3. Remove plug from media tube.
4. Swab the desired area thoroughly, rolling the swab lightly back and forth over sampling area.
5. Insert the swab in the tube, firmly close cap, and label appropriately.
6. For quantitative culture reporting, the area swabbed needs to be entered on the chain of custody.



#### **Sterile Swab**

#8708301

FREE to LA Testing Customers  
*Call for Details*

### Bulk Sampling

1. Obtain sterile sampling bags (Ziplock-type) to collect and transport samples (provided at your request by LA Testing).
2. Wearing gloves and using clean tools remove a representative area of growth along with the building material (sheetrock, wood, etc). 1 inch square is sufficient.
3. Place bulk material into sampling bag and label the outside of the bag with sampling location or description.

### Sample Shipment

- Complete an LA Testing Chain of Custody (COC), available on our website ([www.LATesting.com](http://www.LATesting.com)), detailing client name and information, project name or number, sample #, and a description of the area.
- Place samples in a cooler with reusable freezer packs
- Overnight shipping recommended

#### *Tech Tip:* **General Media Recommendations For Air Sampling of Culturable Fungi and Bacteria**

Fungal sampling in general, we recommend MEA. Malt Extract Agar is a general isolating media for culturing a wide-spectrum of fungi. A good media for most of your IAQ projects. Sampling for cellulose-degrading microfungi in water damaged buildings (e.g. *Stachybotrys* sp.) either Cellulose agar or Corn Meal Agar. Bacterial sampling in general, we recommend TSA or TSA w 5% Blood. Sampling for gram negative bacteria, we recommend MacConkey Agar. All other situations, the Microbiology Department will be happy to make recommendation based on your individual sampling situation or project.

## ERMI Dust Sampling

- The **ERMI**® is an acronym for **Environmental Relative Moldiness Index**.
- It was developed by scientists at the Environmental Protection Agency (EPA) to provide a straightforward, objective, and standardized way to obtain results for indoor air quality investigations.
- The EPA has developed an ERMI ranking system based on dust samples collected from homes across the United States.
- The ERMI helps predict the moldiness of homes. Homes with high ERMI values have a greater chance of having a mold problem than homes with a low ERMI.
- 36 different fungi make up the ERMI and are designated as Group I (those found in atypical, water damaged homes) and Group II (those commonly found in all homes).

### Sampling Locations

- For residential sampling, EPA recommends taking a living room and bed room sample as a composite using the same vacuum dust collector for both rooms. Other areas should be sampled separately.
- In the Common Living Area (family room or living room), select the sofa. In the absence of a sofa, select another commonly used chair.
- Using the tape measure and the roll of tape, mark the corners of a 3 foot x 6 foot rectangular sampling area on the floor immediately against the sofa. Place the long side of the rectangle against the long side of the sofa. If the area cannot accommodate the recommended sampling area, adjust the dimensions accordingly. Sample a total of 18 square feet.
- For the bedroom, select the most frequently used bedroom. Using the tape measure and the roll of tape, mark the corners of a 3 foot x 6 foot rectangular sampling area on the floor immediately against the side of the bed where the resident is most likely to get in and out of the bed. If possible try to have the rectangular sampling area extend under the bed by 3 or 4 inches so that part of the sample goes under the bed. Place the long side of the rectangle against the long side of the bed. If the area cannot accommodate the recommended sampling area, adjust the dimensions accordingly. Sample a total of 18 square feet.
- Record the final sampling area you marked with tape on the lines next to the bedroom you sampled on this data sheet.
- Areas other than the Living Room, Family Rooms, or Bedrooms may be sampled. If you choose to sample other areas, a separate vacuum dust collector should be used for each area. Please call the lab if you have any questions.

### Sampling Procedure

1. Make sure the hose attachment is connected to your vacuum cleaner properly. Turn on the vacuum cleaner to make sure the hose attachment is pulling air, and then turn off the vacuum cleaner. Sometimes the dust collection device will not fit correctly onto the hose attachment. If this is the case, you may use duct tape or electrical tape to tape the dust collector to the hose attachment.
2. Use the extension cord as needed to reach the marked area with the vacuum hose.
3. Remove both caps from sampling device. Place the caps in a location so you can find them after the test is completed. Attach the flat, round end of the sampler device to the end of the hose attachment of your vacuum cleaner.
4. Use the slanted end of the sampling device to collect your sample. Keep the slant end of the sampling device flush with the surface to be sampled.
5. Turn on the vacuum cleaner and start the watch or timer. Start timing the vacuuming procedure using the stopwatch. Try not to disturb the tape. Do not exceed the 5 minute sampling period.
6. Vacuum the area contained within the duct or electrical tape. Do this by passing the sampling device over slightly overlapping, imaginary parallel lines within the sampling area for about 5 minutes. If necessary, adjust your rate of movement so that a total of 5 minutes is used to vacuum the entire 18 square foot sampling area.
7. Move to the second room and repeat the vacuuming of the target area. After the sampling is completed, hold the sampling device upward toward the ceiling and turn off the vacuum cleaner. Re-cap the slant end of the sampling device so as not to lose the dust collected.
8. Avoid vacuuming up any large debris that is not dust. If you accidentally suck up the tape, point the sampling device toward the ceiling and turn off the vacuum cleaner. Pick the tape out of the sampling device. Turn the vacuum cleaner back on and return to vacuuming the sampling area. Be sure to account for lost sample time when you do this so you get a total of 5 minutes of sampling time.
9. Separate the sampling device from the hose of the vacuum cleaner and re-cap the flat end of the device.
10. After the small caps are secured on the dust sampling device, make sure there is dust in the sampling container before you send it to the lab. If no visible dust is noticed, repeat the sampling procedure in both rooms in different locations until visible dust is present in the device.
11. If you lose the small caps, seal the openings completely and securely with duct or electrical tape.



## Real-Time PCR

- LA Testing offers state-of-the-art fungal detection and enumeration using US EPA-licensed PCR technology. Real-Time PCR is an excellent complement to your current sampling strategies.
- If you currently use spore traps to reveal the genus names of fungi in indoor environments, you can also submit real-time PCR samples to quickly determine the species names of any significant molds that were found on the spore traps.
- If you use culture techniques to determine the identity of viable organisms, you can use real-time PCR to determine the species names of those organisms sooner.

### Sampling Procedure

#### Air Samples

1. Obtain a 3-piece PCR air/dust-sampling cassette from LA Testing.
2. Remove the upper (blue) and lower (red) plugs of the cassette.
3. Attach a vacuum pump to the cassette through the lower opening.
4. Sample as much air as desired through the upper opening.  
There is no upper limit to sampling time.
5. Record the VOLUME of air sampled and ship cassette to LA Testing.  
No refrigeration is needed.

#### Dust Samples

1. Obtain a 3-piece PCR air/dust-sampling cassette from LA Testing.
2. Remove the upper (blue) and lower (red) plugs of the cassette.
3. Attach a small piece of tubing to the upper opening. Cut a 45-degree angle at the end of the tubing.
4. Attach a vacuum pump to the cassette through the lower opening.
5. Begin collecting dust through the upper tubing. There is no upper limit to sampling time.
6. Ship the cassette to LA Testing. No refrigeration is needed.

#### Swab Samples

1. Obtain a sterile TransPorter swab (Without buffer solution, Product ID 8708301) from LA Testing to collect sample.
2. Wearing gloves, remove swab from packaging material.
3. Swab the desired area thoroughly, rolling the swab lightly back and forth over sampling area. Be sure to record the area sampled.
4. Insert the swab into the tube and firmly close cap. Ship the swab to LA Testing.

#### Bulk Samples

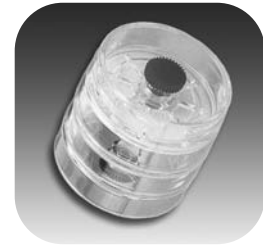
1. Obtain a sterile swab and follow directions as described above for swabs.
2. Alternatively, you may submit a piece of the bulk sample for analysis.

#### Water/Liquid Samples

1. All water samples should be taken in sterile sampling containers, which our laboratory can provide upon request.
2. Fill container with 100 mL of water, or as much water as possible and seal securely to prevent leakage during transport.
3. Transport sample using ice packs to LA Testing

#### Culture Plates

1. If you are interested in fast speciation of your culturable (viable) fungi in your samples, you may combine PCR with culture analysis. Simply ask the laboratory to hold your cultures for follow-up analysis and request the desired PCR organism package.



#### PCR Analysis Individual Cassette

#8715309

List Price: **\$5.00**

USD



#### E-Lite Pump

# 8706004

List Price: **\$169.00**

USD



#### Water Testing Bottles

FREE to LA Testing

Customers

Call for Details

# Allergen Sampling

## Sampling Procedure

### Dust Sampling with a Dust Collector Kit

(Kit available from LA Testing, Product ID 8715600)

1. Insert the white filter tube securely into the dust collector, through the opening at the angled end.
2. Attach the dust collector to the vacuum cleaner hose or tube.
3. Turn on the vacuum cleaner and vacuum 4 separate areas for 30 seconds each, where each area is about 1/4 square meter. Total sampling time is 2 minutes and total area sampled is about 1 square meter.
4. A minimum of 100 mg of dust is required for allergen analysis.
5. Remove the filter tube containing the dust sample and place it in a small Ziploc bag or equivalent. Place entire device in the bag.
6. Label the bag with your sample name or code and ship to LA Testing for allergen analysis.

### Dust Sampling with a Filter Cassette

(Cassettes available from LA Testing, Product ID 8715313)

1. 25mm 0.45m MCE filter cassettes can be attached to a vacuum pump using PVC tubing.
2. A flow rate of 10 LPM is sufficient to collect dust into the cassette.
3. We recommend using a template to establish and standardize sampling areas (carpet, furniture, bedding, etc.).
4. Check clear window at inlet end of cassette to determine that an appreciable amount of dust has collected.
5. A minimum of 100 mg of dust is required for allergen analysis.

### Indoor Allergen Analyses Available

*Test Code and Description:*

- M033 Latex Protein by ELISA
- M034 Cat Dander (Fel d 1) by ELISA
- M035 Dog Dander Dog Dander (Can f 1) by ELISA
- M036 Cockroach Cockroach (Bla g 1) by ELISA
- M037 Dust Mites Dust Mites (Der p 1 & Der f 1) by ELISA
- M038 Mouse Mouse (Mus m 1) by ELISA
- M039 Rat Rat (Rat n 1) by ELISA
- M044 Indoor Allergen Group Cat, Dog, Cockroach, and Dust Mites by ELISA (Enzyme Linked Immunosorbent Assay).

*Note: Multiple allergens can be analyzed from a single dust sample.*



#### Allergen Sampler

#8715600

List Price: **\$7.00** USD



#### LA Testing Carpet Sampling Kit

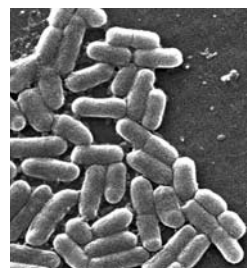
25mm Kit, #8715314

List Price: **\$24.99** USD

## Water Sampling for Total Coliform, *E. coli*, & Fecal Coliform

### Sample Collection

- All water samples must be taken in approved, sterile sampling containers, which our laboratory can provide upon request. Treated (municipality/distribution systems) water samples must be de-chlorinated with sodium thio-sulfate which is provided in the 100mL lab issued bottles.
- Keep sampling bottle closed until it is to be filled.



### Sampling Procedure

#### Distribution or Sink Faucet Sample

1. Remove aerator from faucet.
2. Rinse faucet with a bleach solution.
3. Flush line by turning tap fully on and letting it run for 2 to 3 minutes, or for a time sufficient to permit clearing the service line.
4. Reduce water flow to permit filling bottle without splashing.
5. Collect a 100mL sample to submit for analysis.

#### Well Samples

1. If a sample is taken from a well, fitted with a hand pump, pump the water for about 5 minutes before collecting sample.
2. If the well is equipped with a mechanical pump, collect sample from a tap on the discharge.
3. If there is no pumping machinery, collect sample directly from the well by means of a sterilized bottle attached to a rope or stick of appropriate length. Fit a weight to the base of the bottle. Lower the bottle into the well. Take care to avoid contaminating sample by any surface scum.
4. After the sample has been collected, tighten the lid securely. Using an alcohol wipe, clean the outside of the bottle.

#### Hold Times

- If the sample is taken for compliance purposes or for a discharge permit, Fecal Coliforms, Fecal Streptococcus, and Enterococci samples must be run within 6 hours of sample collection.
- If the sample is taken for compliance purposes or for a discharge permit, Total Coliforms, *E. coli* and Heterotrophic Plate Count samples need to be run within 24 hours of sample collection.
- If client is aware that hold times are going to be exceeded but would like analysis anyway, please indicate this on the Chain of Custody.
- If hold times are exceeded, this may impact the results. This will be noted on the report.

#### Chain of Custody (COC)

- A COC must contain sampling date, time sampled, and sample source. This is needed to determine whether or not samples are within hold times and correct analysis procedure.
- If looking for Total Coliforms please inform us if you would like Presence/Absence (Colilert) or Enumeration (MFT-Membrane filtration technique).
  - Colilert test code: M018
  - MFT test code: M017
- Drinking water samples for compliance or regulatory testing need to have free chlorine tested in the field and included on the chain of custody.

#### Turn Around Times

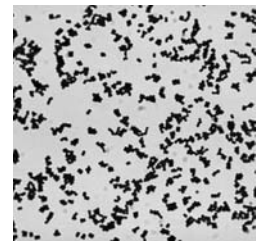
- Total Coliform-Presence/Absence (Colilert) results can be given in 24-48 hours.
- Total Coliform enumeration (MFT), Fecal Coliform, Fecal Streptococcus and Enterococci will take 6-10 days.

#### Sample Shipping

- All samples must be shipped cold, not frozen and should remain upright. The best method of shipment for these samples is to use freezer packs, not soda bottles filled with frozen water, bags of ice or loose ice. Samples that are not shipped properly can become contaminated or may be rejected by the lab.

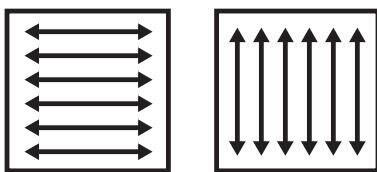
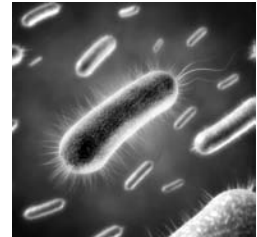
## Sewage Contamination in Buildings

- Methods available to test for sewage contamination in buildings include:
  - M117 – a culture-based method detecting Total Coliforms, *E. coli*, and Enterococci (48 hr TAT)
  - M013 – a culture-based method detecting Total Coliforms, Fecal Coliforms, *E. coli*, and Fecal Streptococcus (6-10 day TAT)
  - M095 – a new PCR-based method detecting Total Bacteroides (24 hr TAT available)
- The culture-based methods have the advantage of looking for only living bacterial contaminants which may be the only ones of interest if disease is of concern. Endotoxin testing can also be of value to measure the total amount of Gram negative bacteria in the building (see page 19).
- The Bacteroides test has some advantages over the traditional culture-based tests including:
  - Bacteroides is specific for fecal contamination from all sources – animals, birds, and human
  - Coliforms, *E. coli*, Fecal Streptococci, and Enterococci can grow in water, soil, sediments and on vegetation in uncontaminated environments (*E. coli* is found in pristine tropical environments).
  - **Bacteroides will not multiply in the environment.**
  - Bacteroides outnumber coliforms by 1,000:1 and outnumber *E. coli* by 10,000:1; therefore, the chance of finding Bacteroides is greatly enhanced.
  - Traditional culture-based tests rely on the presence of live bacteria. These bacteria often will not be viable in indoor environments.  
**THIS MEANS THAT A NEGATIVE COLIFORM or *E. COLI* RESULT DOES NOT MEAN THE ABSENCE OF FECAL CONTAMINATION.**  
The new Bacteroides test overcomes these culture limitations. The laboratory can detect live, nonviable, or viable but not culturable bacteria.



### Sampling Procedure for all Sewage Contamination Tests

1. Obtain a sterile 1 mL Butterfield's Solution swab (LA Testing Product ID 8708935) to collect and transport samples (provided at your request by LA Testing).
2. With gloves on, remove swab from sterile packaging.
3. Carefully unscrew cap of sampling device – swab is attached to the lid of the cap.
4. Gently press out excess solution from sampling swab by pressing the swab against the inside wall of the tube with a rolling motion.
5. Hold swab at an approximate 30° angle from the sampling surface, taking care not to contaminate any part of the swab or the sampling site.
6. Using firm, even pressure move the swab slowly and thoroughly over an entire 4" x 4" sampling area, rewetting the swab tip with the Neutralizing Solution as needed. First horizontally, then vertically:



7. After sampling is complete, carefully put swab back into vial and close cap tight.
8. Label the sample using a permanent ink marker.
9. **Background samples in non-fecally contaminated areas should be taken.**

### Sample Shipping

- Samples that will be submitted for culture-based analysis must be shipped overnight cold, not frozen, within 24 hours from the sample collection. The best method of shipment for these samples is to use a cooler with freezer packs, not bags of ice or loose ice.
- There are no special shipping requirements or hold times for Bacteroides since they will not multiply outside of the intestine. However, do not store sample longer than a month before analysis

## Legionella Sampling

- *Legionellaceae* are ubiquitous in surface water, groundwater, estuarine environments. Most outbreaks of disease due to *Legionella* are due to contaminated mist from cooling towers and potable water distribution systems. Exposure occurs from contaminated, aerosolized water.
- We offer four different culture-based methods depending upon the level of information you need. For more information about the different tests please go to [www.legionellatesting.com](http://www.legionellatesting.com). All culture tests require 10-14 days before completion.

We also offer several different PCR methods depending upon the information you need. More information about these can also be found at [www.legionellatesting.com](http://www.legionellatesting.com). While the culture method is considered the “Gold Standard”, PCR is useful for ruling out possible *Legionella* contamination in time-sensitive projects. PCR results can be requested same-day, 24 hrs and 48 hrs depending on your needs.

### Where to Look

This is a list of water systems that have been demonstrated to harbor *Legionella* bacteria and have been associated with outbreaks. Their investigation should be included in any *Legionella* Risk Assessment program:

- Potable water systems
- Cooling towers
- Aerosol generation during the biological treatment of some industrial process wastewater streams. For example, pulp and paper manufacturing, food and beverage manufacturing and pharmaceutical manufacturing.
- Aerosol generation during municipal water and wastewater treatment
- Raw, utility or fire water
- Ornamental outdoor and indoor water fountains and ponds
- Heated swimming pools
- CPAP water
- Potting soil
- Hot tubs
- Humidifiers
- Metal working fluids
- Medical therapy equipment like dialysis units, nasogastric tubes, respiratory equipment and nebulizers, whirlpool baths
- Commercial car wash facilities particularly those using recycled water
- Supermarket vegetable misters
- Ice machines in hotels and hospitals
- Outdoor body misters at ballparks and amusement parks\*



*\*Has not been associated with any cases of legionellosis.*

### Sampling Considerations

- Water samples must be collected in sterile vessels (available from LA Testing).
- A 1 L water sample is recommended for potable waters (containing sodium thiosulfate).
- Less than 1 L is acceptable if higher levels of bacteria are suspected.
- Chlorinated water must be treated with sodium thiosulfate.
- 100-250 mL is typically sufficient for non-potable water samples.
- In addition to collecting water samples it is useful to collect a swab of the biofilm found in the water supply pipes.
- Samples must be transported to the laboratory within 24 hrs in coolers with freezer packs.

### Cooling Tower Sampling Locations - Sample Quarterly

- Tower Makeup
- Tower Sump away from makeup\* (water and swab)
- Inlet to Heat Exchanger
- Outlet from Heat Exchanger
- Distribution Pack
- Tower Pack\* (water and swab)

### Potable Water Sampling Locations - Sample Semi-Annually

- City Water Main Entry Point
- Storage Tanks
- Hot Water Heater Drain Point\*
- Hot Water Return
- Last Point on Cold Water/First Point on Hot Water
- Last Point on Hot Water\*/First Point on Cold Water
- 10% of Selected Outlets (water and swab)\*

*\*Test routinely*

### Legionella Routine Sampling Locations

- Test all locations to establish a baseline
- Test all locations during an outbreak

### Sample Collection

1. Collect water samples from the or from the cooling tower basin water, hot water storage tanks, showers, water taps, etc.
2. If sampling for PCR analysis, collect 100 mL of water and another 1000 mL if potable water or 250 mL if non-potable water is sampled if culture results are also needed.

### Sample Shipping

- Label sample number on the bottle and record on the chain of custody.
- Use a distinctive number for each sample. Complete all sample information on a sample data sheet for your own record. Send a copy with the samples to the laboratory. You can download a copy of the Chain of Custody form on our website [www.LATesting.com](http://www.LATesting.com).
- Tightly cap the bottles. Make sure that water does not leak during shipping and transporting. Taping of the bottle around the cap and neck with electric vinyl tape is recommended. Place taped bottles in a clean plastic bag.
- Place the samples in insulated boxes or on freezer packs to protect them from extreme temperature fluctuations in the summer months. **NEVER USE ICE OR DRY ICE.** Stuff the box with foam chips to cushion, and seal the box securely for shipping. Send samples by overnight express carrier. Schedule sampling between Monday and Friday so that samples can be delivered to the laboratory no later than Saturday.



## Methicillin-resistant *Staphylococcus aureus* (MRSA) Sampling

- Methicillin-resistant *Staphylococcus aureus*, (MRSA) is a type of bacteria that is resistant to treatment with antibiotics related to penicillin. This bacterium is generally spread through direct contact with the hands of a health care worker or person who is infected or carrying the organism. There are also community-acquired infections that have occurred outside the hospital environment in places such as gyms, schools, daycares, cruise ships, and elderly care facilities.
- LA Testing provides MRSA Analysis of **Environmental Samples** (swab, bulk, or water).  
*Please note, we are not able to accept clinical specimens for testing.*
- Caution must be taken by wearing gloves when collecting samples from contaminated items; put on clean gloves immediately before collection. Remove gloves promptly after use, before touching non-contaminated items and environmental surfaces and wash hands immediately to avoid transfer of microorganisms to other environments.

### Sampling Procedure

#### Swab Sampling

1. Obtain a sterile 1 mL Butterfield's Solution swab (Product ID 8708935) from LA Testing to collect samples for culture or a TransPorter swab (Product ID 8708301) for PCR testing.
2. Remove swab from packaging material and swab the desired area thoroughly; rolling the swab lightly back and forth over sampling area. A 4"x 4" area is recommended. Insert the swab into the tube and firmly close the cap. Ship the swabs to LA Testing.

#### Bulk Samples

1. Wearing gloves, remove a small piece of the suspect material. Place piece inside a clean sterile container or new plastic bag (Ziplock).
2. Close the bag or cap the container and label appropriately.

#### Contact Plates

1. Store the contact plate at 2-8° C. Product is light and temperature sensitive; protect from light, excessive heat, moisture, and freezing.
2. Hold the plate with thumb and second finger and use index finger to press plate bottom firmly against the selected test surface. The same amount of pressure should be applied for every sample.
3. Do not twist or move the plate laterally. Lateral movement spreads contaminants over the agar surface, thus making resolution of colonies

#### Sample Shipping

- All samples must be shipped overnight cold, not frozen, within 24 hours from the sample collection. The best method of shipment for these samples is to use freezer packs, not bags of ice or loose ice. Samples that are not shipped properly could get contaminated and may be rejected by the lab.
- LA Testing offers a culture-based MRSA testing method (Code M133) and a PCR-based method (Code M203) for faster turnaround times.

## Endotoxin Sampling

- Endotoxins are compounds that are found in the cell walls of gram negative bacteria. Endotoxins can cause flu-like symptoms when inhaled and may aggravate asthma.
- High levels have been reported from a variety of environments, such as in recycled water, cotton mills, agriculture or wastewater treatment facilities, industrial wastewater mists, and contaminated room humidifiers. High levels of Endotoxins are found in any recycled fluid.

### Summary of Procedures

- Air samples are collected on endotoxin-free membrane filters, stored desiccated wherever possible, or stored at 4°C. Endotoxin analysis can be done on air, water, or bulk samples.

### Caution

- There are no accepted threshold values, so relative value comparisons have to be made between the suspect area, and a non-suspect one under similar environmental conditions.
- Since endotoxin levels may be significant in outside air, the latter may not be suitable for background levels, especially in environments known to have high levels of gram-negative bacteria (see above, 1st paragraph).
- All sampling utensils must be certified endotoxin-free. PVC and polypropylene materials cannot be used due to their affinity and binding with endotoxin.

### Materials

- Fluids and Bulk samples: Collect in endotoxin-free (glass or polystyrene) containers (LA Testing Product # 8715711).
- For air sampling: low-flow pump, rotameter flexible tubing endotoxin-free polystyrene cassettes (LA Testing Product # 8715700) with 37mm diameter 0.4  $\mu\text{m}$  polycarbonate membrane filters and AP40 glass-fiber backing pads. These must be specially treated to remove all endotoxins.
- Sterile surgical gloves should be worn for all samples.

### Sampling Procedure

#### Air Sampling

1. Caution must be taken to avoid breathing on, touching, or otherwise exposing the sampling containers to human contamination.
2. For indoor sampling, ensure that all doors and windows are closed.
3. Calibrate pump to 1.5 liters per minute
4. Using glove, connect cassette to pump with the red-capped end toward the pump. Collect air samples for 4 hours per sample.
5. Disconnect cassette and replace the protective covering back on both the inlet and outlet of the cassette, and wrap entire cassette in original packing and seal with tape.

#### Liquid or Bulk Sampling

1. Liquid samples must be collected in endotoxin free vials only which can be purchased from the lab.

#### Sample Shipping

- Complete an LA Testing Chain of Custody (COC), available on the website ([www.LATesting.com](http://www.LATesting.com)), detailing client name and information, project name or number, sample #, and a description of the area.
- Ship samples to LA Testing as soon as possible. Liquid samples should be shipped on freezer packs.

#### Quality Control Recommendations

- Multiple samples need to be collected at a site in order to compare a possibly affected area with an unaffected one.



**Endotoxin  
Individual Cassette**  
#8715700  
List Price: **\$15.00**  
USD

## Sampling in the Food Industry

### Food Contact Surfaces

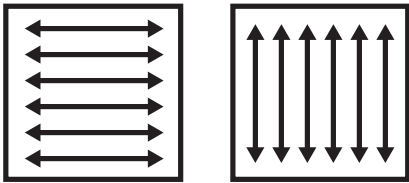
Wash hands thoroughly with soap and water before and after sample collection.

### Materials

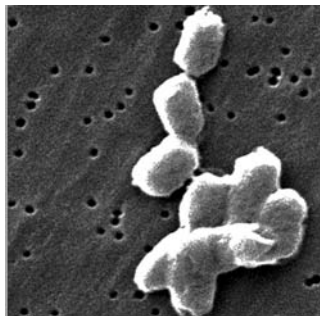
- Environmental swab with 10 mL Buffer Solution (1 per sampling site)
- Permanent Ink Marker
- Predetermined sampling site of **approximately 4" x 4"** (~ 100 cm<sup>2</sup>), or for more intricate surface areas, an equivalent area estimation or a "per part" sample is acceptable.
- Gloves (non-sterile)

### Sampling Procedure

1. With gloves on, remove swab from sterile packaging.
2. Carefully unscrew cap of sampling device – swab is attached to the lid of the cap.
3. Gently press out excess solution from sampling swab by pressing the swab against the inside wall of the tube with a rolling motion.
4. Hold swab at an approximate 30° angle from the sampling surface, taking care not to contaminate any part of the swab or the sampling site.
5. Using firm, even pressure move the swab slowly and thoroughly over the entire sampling area, rewetting the swab tip with the Neutralizing Solution as needed. First horizontally, then vertically:



6. After sampling is complete, carefully put swab back into vial and close cap tight.
7. Label the sample using a permanent ink marker.
8. Keep sample(s) at a refrigerated temperature (35° – 40° F) until it is submitted to the laboratory for analysis. Submit within 24 hours of sampling.



## Sampling Non-Food Contact Surfaces

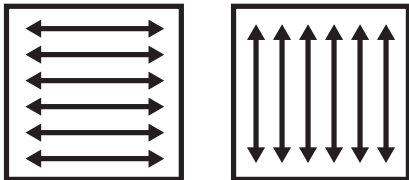
Wash hands thoroughly with soap and water before and after sample collection.

### Materials

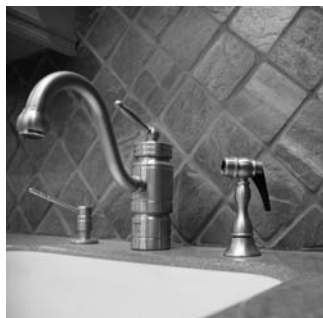
- Whirl-Pak Bag, Sterile Sponge (pre-wetted), Sterile Gloves (Pre-packaged) 1 per sampling site
- Predetermined sampling site of **approximately 10" x 10"** (100 in 2), for more intricate surface areas, an equivalent area estimation or a "per part" sample is acceptable.
- Permanent Ink Marker

### Sampling Procedure

1. Separate the glove/sponge portion from the sponge Whirl-Pak at the perforation
2. Tear off the clear, perforated strip at the top of the Whirl-Pak bag
3. Put on the sterile glove.
  - a. Remove the sterile glove from the pouch by the top edge with out contaminating (touching, breathing on, contacting etc.) the glove
  - b. Remove a glove by holding it from the wrist-side opening. Avoid any contact with the outer surface of the glove. Insert clean hand into glove, taking care not to puncture the glove.
4. Open the bag containing the sponge, wearing sterile gloves, being careful not to touch sponge to anything but the gloved hand.
5. With gloved hand, remove sponge from the bag.
6. Using firm, even pressure move sponge slowly and thoroughly over sampling area. First horizontally, then vertically:



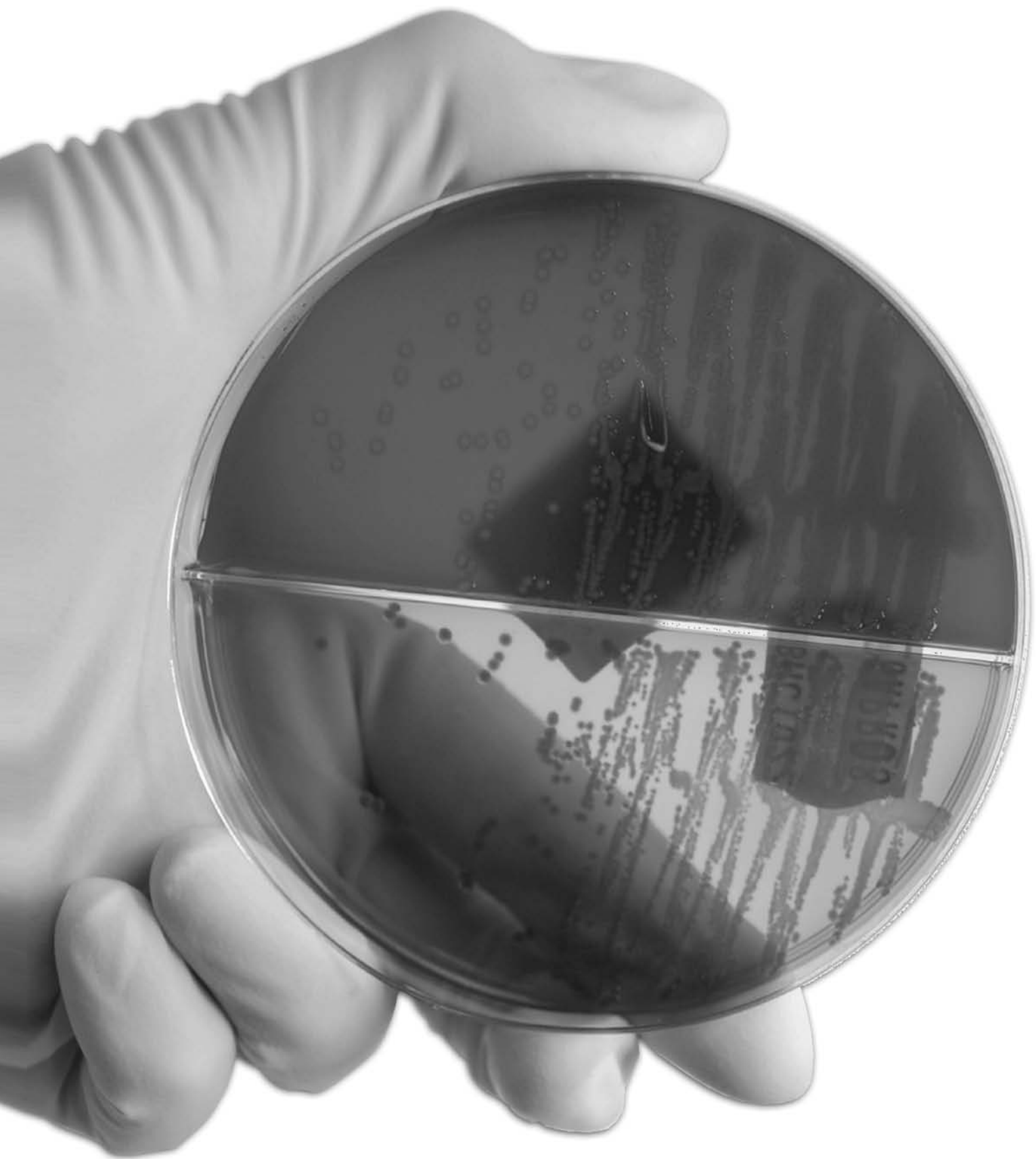
7. Return sponge back to Whirl-Pak bag taking care not to contaminate the sponge or the bag with the ungloved hand.
8. Close the bag by folding the top down three times and bending the wire ends over onto the bag.
9. Label the sample using a permanent ink marker.
10. Keep sample(s) at a refrigerated temperature (35° - 40° F) until it is submitted to the laboratory for analysis.



### Whirl-Pak Bags

2 oz Write-On Bags  
500 qty, #8708908  
List Price:  
**\$38.50**  
USD

4 oz Write-On Bags  
500 qty, #8708909  
List Price:  
**\$40.00**  
USD



## Limiting Conditions for Pathogen Growth

Guidance provided by LA Testing

Pathogens	Min. a <sub>w</sub>	Min. pH	Max pH	Max % salt	Min. Temp. (°C)	Max. Temp.	Oxygen Requirement
<i>Campylobacter jejuni</i>	0.99	4.9-5.5	8.0	1.5-2.0	30-32	42-45	Micro-aerophilic
<i>Clostridium botulinum</i> type A, and proteolytic B and F	0.93-0.96	4.7	9.0	10.0	10.0	48-50	Anaerobe
<i>Clostridium botulinum</i> type E, and nonproteolytic B and F	0.93-0.96	4.7-4.8	9.0	4.5-6.0	3.0	45	Anaerobe
<i>E. coli</i>	0.93-0.95	3.6-4.7	9.5	7.5-8.0	0.6-3.0	45	Facultative anaerobe
<i>Listeria monocytogenes</i>	0.92-0.95	4.8	9.6	8-12	0-2.0	45	Facultative anaerobe
<i>Salmonella</i> spp.	0.92	4.0	9.0	8.0	5.0	46-47	Facultative anaerobe
<i>Shigella</i> spp.	0.96	6.0	10.0	6.0	7.0	46	Facultative anaerobe
<i>Staphylococcus aureus</i>	0.85-0.86	4.0	10.0	18-20	5-6*	45-45	Facultative anaerobe
<i>Vibrio cholerae</i>	0.95	3.6-6.0	9.6	6-8	8.0	42-46	Facultative anaerobe
<i>Vibrio parahaemolyticus</i>	0.94	4.8-5.0	9.6	8-10	5.0	43	Facultative anaerobe
<i>Vibrio vulnificus</i>	0.95	6.3	9.0	6.0	13.0	44	Facultative anaerobe
<i>Yersinia enterocolitica</i>	0.95-0.96	4.1-4.4	9.0	6-7	-1.0 – 1	44	Facultative anaerobe

\*Minimum temperature for toxin formation is 10° C  
 Micro-aerophilic: requires limited levels of oxygen  
 Anaerobe: requires the absence of oxygen  
 Facultative anaerobe: grows either with or without oxygen

## Microbiology Culture Media Information

LA Testing is able to provide a large variety of sampling media to our customers.

The following information is designed to help aid in the selection of culture media, providing the most representative sample of the environment possible. The media listed below are not exhaustive; if you have specific media requirements, please let us know.

### Bacterial Media

- TSA (Tryptic Soy Agar)
- TSA w/ 5% Blood
- MAC (MacConkey)
- HE Agar (Hekton Enteric )
- BCYE agar (Buffered Charcoal Yeast Agar)
- MSA (Mannitol Salt Agar)
- EMB (Eosin Methylene Blue)
- BE (Bile Esculin Agar)
- Chocolate Agar
- BHI (Brain Heart Infusion)
- Xylose lysine deoxycholate agar (XLD agar)

### Fungal Media

- MEA (Malt Extract Agar)
- PDA (Potato Dextrose Agar)
- Cellulose Agar
- SAB (Sabouraud Dextrose Agar)
- Corn Meal Agar
- DG18 (Dichloran-Glycerol Agar 18)
- Bird Seed Agar
- Mycobiotic Agar

### General Media Recommendations for Air Sampling of Culturable Bacteria and Fungi

- For fungal sampling, in most cases, we recommend MEA.
- For fungal species identification use MEA and DG18 plates
- For bacterial sampling, in most cases, we recommend TSA or TSA w 5% Blood.
- When sampling specifically for Gram negative bacteria, we recommend MacConkey Agar.
- The Microbiology Department will be happy to make recommendations based on your individual sampling situation.

## Fungal Culture Media

- MEA (Malt Extract Agar) Gold Standard media for the speciation of fungi.
- PDA (Potato Dextrose Agar) General-purpose media used for the isolation of fungi and molds.
- Cellulose Agar Multi-purpose microbial media used to isolate or for isolating hydrophilic fungi microbes able to utilize complex carbohydrates. Most often recommended in IAQ investigations of *Stachybotrys sp.* contamination.
- Corn Meal Agar General purpose media for the cultivation of fungi from the environment, commonly used in IAQ investigation of *Stachybotrys chartarum* contamination.
- DG18 (Dichloran-Glycerol Agar 18) Media containing 18% glycerol, used for the recovery of Xerophilic yeast and molds. Recommended for recovery in dry locations such as dry powder storage and manufacturing areas.
- Bird Seed Agar For the isolation of *Cryptococcus neoformans*.
- Mycobiotic Agar For the isolation of *Histoplasma capsulatum*

## Bacterial Culture Media

- TSA (Tryptic Soy Agar) General purpose media for isolation and culture of bacteria (gram positive and gram negative).
- TSA w/ 5% Blood General purpose media for cultivation, isolation and determination of hemolytic activity of bacteria.
- MAC (MacConkey) For quantitative procedures for the isolation of gram negative bacteria and for the differentiation of those microorganisms based on fermentation of lactose.
- HE Agar (Hekton Enteric) For the isolation and differentiation of gram negative enteric microorganisms.
- BCYE agar (Buffered Charcoal Yeast Agar) For the isolation, selection and differentiation of *Legionella sp.* from environmental samples.
- MSA (Manitol Salt Agar) For the selective isolation and differentiation of *Staphylococcus sp.*
- EMB (Eosin Methylene Blue) For the isolation and differentiation of gram negative bacteria.
- BE (Bile Esculin Agar) For the isolation and identification of Group D *Streptococcus sp.*
- Xylose lysine deoxycholate agar (XLD agar) For the isolation and differentiation of *Salmonella sp.*



## Laboratory Locations

**Arizona – Phoenix (1,2)**  
**Asbestos and Mold Testing**  
3539 East Broadway, Phoenix, AZ 85040  
Tel: 602-276-4344

**California – Los Alamitos (1,2,3,4)**  
LA Testing  
**Asbestos, Lead, Mold, Bacteria and Industrial Hygiene Testing**  
10772 Noel Street, Los Alamitos, CA 90720  
Tel: 800-755-1794



**California – South Pasadena (1,2,3,4)**  
LA Testing  
**Asbestos, Lead, Mold, Bacteria, Food Micro and Materials Testing**  
520 Mission Street, South Pasadena, CA 91030  
Tel: 800-303-0047



**California – Sacramento (1)**  
**Asbestos and Mold Testing**  
4640 Northgate Blvd., Ste 160, Sacramento, CA 95834  
Tel: 916-921-8251

**California – San Diego (1,2)**  
**Asbestos and Mold Testing**  
7916 Convoy Crt., Bldg 4, Ste A, San Diego, CA 92111  
Tel: 858-499-1303

**California – San Leandro (1,2)**  
**Asbestos and Mold Testing**  
2235 Polvorosa Ave., Ste 230, San Leandro, CA 94577  
Tel: 888-455-3675

**California – Torrance (1,2)**  
LA Testing  
**Asbestos and Mold Testing**  
2200 Amapola Court, Suite 102, Torrance, CA 90501  
Tel: 310-618-0400



**Colorado – Denver (1)**  
**Asbestos and Mold Testing**  
7330 S Alton Way, Bldg 12, Ste A  
Centennial, CO 80112  
Tel: 303-740-5700

**Connecticut – Wallingford (1,2)**  
**Asbestos, Mold and Bacteria Testing**  
4 Fairfield Blvd., Wallingford, CT 06492  
Tel: 203-284-5948

**Florida – Miami (1,2)**  
**Asbestos and Mold Testing**  
Skylake Executive Industrial Park  
19501 N.E. 10th Ave., Bay A  
N. Miami Beach, FL 33179  
Tel: 305-650-0577

**Florida – Orlando (1,2,4)**  
**Asbestos, Lead and Mold Testing**  
5125 Adanson St., Ste 900, Orlando, FL 32804  
Tel: 407-599-5887

**Florida – Pensacola Service Center**  
216 S. Tarragona St., Ste A, Pensacola, FL 32502  
Tel: 877-475-5866

**Florida – North Port Service Center**  
2500 Bobcat Village Center Road, Unit F  
North Port, FL 34288  
Tel: 941-423-4597

**Florida – Tampa Service Center**  
10150 Highland Manor Drive, Ste 200  
Tampa, FL 33610  
Tel: 813-314-2464

**Georgia – Atlanta (1,2)**  
**Asbestos, Mold and Bacteria Testing**  
1800 Water Place, Ste 228, Atlanta, GA 30339  
Tel: 770-956-9150

**Illinois – Chicago (1,2,4)**  
**Asbestos, Lead, Mold and Food Micro Testing**  
2444 West George St., Chicago, IL 60618  
Tel: 773-313-0099

**Indiana – Indianapolis (1,2,3,4)**  
**Asbestos, Lead, Mold, Bacteria and Industrial Hygiene Testing**  
2001 East 52nd St., Indianapolis, IN 46205  
Tel: 866-736-4824

**Louisiana – Baton Rouge (1,4)**  
**Asbestos, Lead and Mold Testing**  
11931 Industriplex Blvd., Ste. 100  
Baton Rouge, LA 70809  
Tel: 225-755-1920

**Maryland – Beltsville (1,2,3,4)**  
**Asbestos, Lead, Mold and Bacteria Testing**  
10768 Baltimore Avenue, Beltsville, MD 20705  
Tel: 301-937-5700

**Massachusetts – Boston (1,3)**  
**Asbestos and Mold Testing**  
7 Constitution Way, Ste. 107, Woburn, MA 01801  
Tel: 781-933-8411

**Michigan – Ann Arbor (1)**  
**Asbestos and Mold Testing**  
212 S. Wagner Rd., Ann Arbor, MI 48103  
Tel: 734-668-6810

**Minnesota – Minneapolis (1,2)**  
**Asbestos, Lead and Mold Testing**  
14375 23rd Ave. North, Minneapolis, MN 55447  
Tel: 763-449-4922

**Missouri – St. Louis (1,2,3,4)**  
**Asbestos, Lead, Mold, Bacteria and Food Industry Testing**  
3029 S. Jefferson Street, St Louis, MO 63118  
Tel: 314-577-0150

**Montana – Libby (1)**  
**Asbestos Testing**  
107 West 4th St., Libby, Montana 59923  
Tel: 406-293-9066

**New Jersey – Piscataway (1)**  
**Asbestos and Mold Testing**  
1056 Stelton Rd., Piscataway, NJ 08854  
Tel: 732-981-0550

**New Jersey – Cinnaminson Corporate Headquarters**  
200 Route 130 North, Cinnaminson, NJ 08077  
Tel: 800-220-3675

**New Jersey – Westmont (1,2,3,4)**  
**Asbestos, Lead, Radon, Mold, Bacteria, Environmental Chemistry, PCR, Materials Science, Food Micro and Industrial Hygiene Testing**  
107 Haddon Ave, Westmont, NJ 08108  
Tel: 800-220-3675

**New York – Buffalo (1)**  
**Asbestos and Mold Testing**  
490 Rowley Rd., Depew, NY 14043  
Tel: 888-260-5887

**New York – Carle Place (1,3,4)**  
**Asbestos, Lead and Mold Testing**  
208 Stonehinge Lane, Carle Place, NY 11514  
Tel: 516-997-7251

**New York – New York City (1,2,3,4)**  
**Asbestos, Food Micro, Lead, Mold and Bacteria Testing**  
307 West 38th St., New York, NY 10018  
Tel: 866-448-3675

**North Carolina – Charlotte (1)**  
**Asbestos and Mold Testing**  
4335 Stuart Andrew Blvd., Ste 101  
Charlotte, NC 28217  
Tel: 704-525-2205

**North Carolina – Kernersville (1,4)**  
**Asbestos, Lead and Mold Testing**  
706 Gralin St., Kernersville, NC 27284  
Tel: 336-992-1025

**North Carolina – Raleigh (1,2,3)**  
**Asbestos and Mold Testing**  
1101 Aviation Pkwy, Ste. A, Morrisville, NC 27560  
Tel: 919-465-3900

**Pennsylvania – Plymouth Meeting (1)**  
**Asbestos and Mold Testing**  
521 Plymouth Rd., Ste 107  
Plymouth Meeting, PA 19462  
Tel: 610-828-3102

**South Carolina – Charleston Service Center**  
975 Morrison Drive, C-2, Charleston, SC 29403  
Tel: 888-958-8170

**Texas – Houston (1,2)**  
**Asbestos, Food Micro, Mold and Bacteria Testing**  
8700 Jameel Road, Ste. 190  
Houston, TX 77040  
Tel: 713-686-3635

**EMSL CANADA, Inc. – Ontario (1)**  
10 Falconer Drive, Unit 3  
Mississauga, Ontario, L5N 3L8  
Tel: 289-997-4602



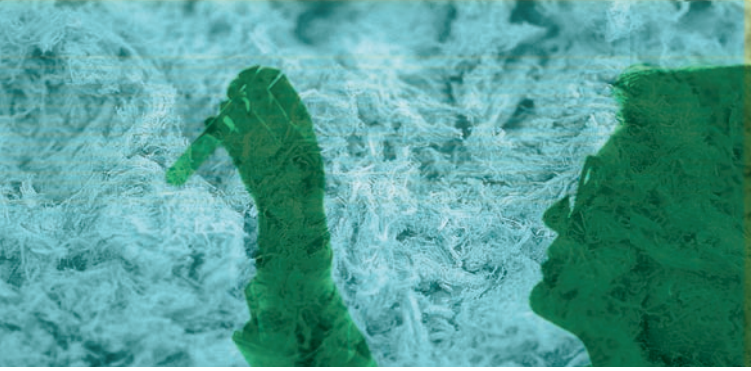
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**LOS ANGELES COUNTY LABORATORIES**

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**800.303.0047**

2200 Amapola Court, Suite 102, Torrance, CA 90501

**310.618.0400**

**ORANGE COUNTY LABORATORY**

10772 Noel Street, Los Alamitos, CA 90720

**800.755.1794**