Easygel® Total Count-Air
For Indoor Air Biological Quality Check

Health impact for indoor air biological pollutants:

Some biological contaminants may trigger allergic reactions, including hypersensitivity pneumonitis, allergic rhinitis, some types of asthma. Molds and mildews release disease-causing toxins. Symptoms of health problems caused by biological pollutants may include:
Sneezing, watery eyes, coughing, shortness of breath, dizziness, lethargy fever and digestive problems (https://www.epa.gov/indoor-air-quality-iaq/biological-pollutants-impact-indoor-air-quality).
Children, elderly people and people with breathing problems, allergies, and lung diseases are particularly susceptible to disease-causing biological agents in the indoor air.

USEPA has recommended a procedure which may be useful to monitor indoor air biological quality. It specifies exposing an open agar petri dish to the environment for 15 minutes, replacing the lid and incubating at 35° C for 48 hrs and then counting the number of colonies (https://nepis.epa.gov; search 600878017, page 196-7). Micrology Labs has created a special kit to assist you to monitor your indoor air biological quality, Easygel® TOTAL COUNT-AIR.

Easygel® TOTAL COUNT-AIR is specially formulated to grow bacteria and molds at the same time. Easygel® is our patented testing method. It is not agar, but an agar replacement. Easygel® is a sterilized, two-piece unit, including a bottle of liquid medium and a petri dish pre-treated (coating on the bottom) with a special formulation. It is simple to use. Just pour one bottle of liquid medium into the bottom of a pre-treated petri dish. Within 60 minutes at room temperature, the solution solidifies into a gel.

The Easygel® bottles and special petri dishes are sterile. Handle them carefully.

Procedure:

1. Determine the number of locations to be tested. (It is a good idea to run at least one control test with dishes exposed to outside air.) Remove the corresponding number of petri dishes from a sleeve and lay them on a level surface with the lid side up. Close the sleeve if any petri dishes are unused. Do not touch the inside of the petri dishes or expose them to the outside environment until you are ready to use them. Label the bottom of the dishes with a wax pencil or magic marker with the date, location of dish, and length of exposure, Otherwise this may be done at the end of the exposure period.

2. Lift the lid of a petri dish and pour the Easygel® into the dish bottom. Replace the lid and swirl gently until the bottom is covered. Allow to solidify for 60 minutes. To avoid waiting, you may wish to pour the dishes a day in advance.

3. Carry the dish(s) to the area(s) (Air ducts or carpeted areas with heavy traffic are good test areas) you wish to test. Place the dish(s) on a steady surface, and remove the lid. Leave open dishes exposed to the environment for a given period of time – (15 min. suggested). Replace the lid(s) once the desired time has been reached.

4. Incubate right side up at 25-32°C (or a warm area). Check for microbial growth at 24 hour intervals. Any growth should be visible in 48-72 hours. Record the number of colonies. Molds grow on or in Easygel® as fuzzy-looking circular colonies on the surface the medium. Yeasts generally look like dense, smooth, non-fuzzy colonies. Bacterial colonies are of varying sizes, shapes and colors and may be transparent to opaque. Bacterial colonies often remain small without much spreading growth. As mold colonies mature, they will grow in diameter and commonly develop color in the colony center from the production of spores. A single mold colony originating from one spore may grow to cover the entire surface area of a plate. DO NOT incubate in strong direct light.

5. Tape the dish lids shut so that there is no danger of opening and spreading spores from the growing molds into the environment for further contamination.

6. **Interpretation:** First, it must be understood that if the test environment is very clean, no colonies may appear on the plate. This does not mean that the medium is defective, but rather that the test area had a low level of microbes floating in the air. Neither does it mean that there are no microbes present in the vicinity. In this case, you may want to test the areas with rugs or carpets to determine mold or bacterial density. For example, if there are rugs or carpet in the test area, beat them or swat them to cause any microbes to become airborne (you may open the plate and hold it with the open medium facing the carpet and then hit the carpet with your hand to cause spores or bacteria to be released and settle on the plate.) Also, doing sweeping or active dusting will generally stir up spores that have settled out of the air and make them airborne again. Swabbing surfaces and transferring the collected material into the liquid Easygel® in the bottle and pouring into the pretreated dish will also generally result in better collection of settled spores or bacteria.

   There are no generally stated absolute standards for what number of colonies is considered acceptable or unacceptable. Less than 3 bacterial and 2 mold colonies per/dish would be indicative of a relatively clean environment. More colonies may be a reason for concern and action. The Tester must determine what is an acceptable level based upon their specific situation. For example, if persons working or living in the test environment are experiencing symptoms (sneezing, nasal discharge, headaches, etc.) or if products made in the area are showing unacceptable levels of contamination, corrective actions may be necessary.

Category of contamination	CFU* per petri dish/ 15 minute exposure	
	Bacteria	Mold
Very low	<3	<2
Low	<7	<7
Intermediate	<33	<33
High	<133	<133
Very high	>133	>133

*: colony forming unit

A Canadian guide on office buildings (Nathanson 1993), based on some five years of investigation of around 50 air-conditioned federal government buildings, includes some guidance on numbers in the above Table. The following are among the main points made:

1. The "normal" air flora should be quantitatively lower than, but qualitatively similar to, that of outdoor air.
2. The presence of one or more mold species at significant levels in indoor but not outdoor samples is evidence of an indoor amplifier.
3. More than 3 colony-forming units per petri dish may be of concern if there is only one species present; up to 15 per petri dish is acceptable if the species present reflect the flora outdoors.

If you suspect any harmful mold or bacterium present, you may want to contact a professional laboratory for further identification and advice.

7. Any unused Easygel® bottles and petri dishes may be stored at room temperature to be used at a later time. They have a shelf life of 1 year (see package labeling).

   Disposal of used petri dishes may be accomplished by placing 5 mL (about 1 teaspoon) of bleach into each dish so that the surface is flooded. Allow to stand for at least 5 minutes and then place in water-tight bag and discard in trash. Plastic petri dishes are intended for one-time use only.