

Laboratory Analytical Guidelines

Non-viable/viable air samples (spore traps)

- Compare the outside air counts with the inside counts. Outside concentrations are considered normal concentrations. All counts represent organisms and particulates in one cubic meter of air.
- Unless otherwise noted, all counts determined under oil immersion (100X objective); (spores counted) x (25% of objective field view / the length of trace) x (lm³).
- Particulate counts based on relative concentrations based on the following criteria:

Low	Up to concentration levels of approximately 30,000 per cubic meter
Medium	Between 30,000 and 70,000 per cubic meter
High	Greater than 70,000 per cubic meter (this is generally considered "Too Many to Count").

Tape Lift / Bulk / Random Air

- Samples are based on a relative concentration of 5 random passes. Actions per quantification are as follows:

Trace	Ubiquitous / normal amounts, indicates no action required (<5 spores total)
Minor	Indicates potential growth, or prolonged exposure to ubiquitous mold (>5 spores total)
Significant	Indicates some limited contamination may exist, requires further investigation (2-5 spores per field)
Abundant	Indicates colonization / contamination, requires remediation (too many to count with hyphal fragments)

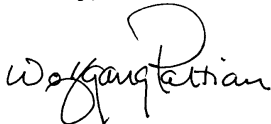
Cultures

- All fungal air culture counts are calculated using "Positive Hole Conversion Adjustment" and listed as colony forming units per cubic meter. Specifics regarding "Positive Hole Conversion Adjustment" are available upon request.
- All other cultures are listed as colony forming units only.
- Bacterial cultures are identified using the Crystal BBL identification process.

All Analysis

- Limit of detection is presented as the calculation concentration for recovery of a single spore for the indicated sample volume and processing conditions. Reported data were obtained from samples and sampling information as provided by the on-site investigator. This data and general information are provided to assist the client or inspector in an overall assessment. Interpretation of the data is left to the client or persons contracted by client to interpret collected analysis of that data.
- TMTC (Too Many To Count) indicates colonies that run together and cannot be specifically counted.
- High debris / particulate counts can impact the efficiency of accurate spore collection. Spore counts can potentially be lower as particulates increase.
- Unless otherwise noted, all identification determined under oil immersion (1000X).
- Sample identification obtained by direct microscopic examination of wet-mounted slides.

Sincerely;



Wolfgang Paltian
Microscopist / Mycology

*Member: National Environmental Health Association, American Industrial Hygiene Association, and Indoor Air Quality Association
Partner with the U.S. Environmental Protection Agency in establishing Indoor Air Quality guidelines and protocol*

AIHA EMPAT #164534

Additional information can be found at the website:

www.themoldsource.com

Laboratory Analysis

Project Name:

Address:

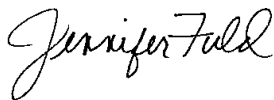
Lab File Number:

Received Date: 1/30/2004

Analysis Date: 1/30/2004

Lab Number	10707	10708	10709	10710	10711
Customer Number	1	2	3	4	5
Customer Identification	Bathrm Corner	Shower Ceiling	Window Sill	Under Sink	Another Bathrm Corner
		Vent			
<i>Alternaria</i>	trace				
<i>Ascospores</i>					
<i>Basidiospores</i>	trace	trace			
<i>Bipolaris / Drechslera</i>					
<i>Cercospore</i>					
<i>Chaetomium</i>					
<i>Chlamydozspores</i>	abundant	significant			abundant
<i>Cladosporium</i>	abundant		abundant	minor	
<i>Curvularia</i>					
<i>Epicoccum</i>					
<i>Fusarium</i>					
<i>Microsporum</i>					
<i>Penicillium / Aspergillus</i>	minor				
<i>Periconia</i>					
<i>Pithomyces / Ulocladium</i>	minor				
<i>Rhizopus / Mucor</i>					
<i>Stachybotrys / Memnoniella</i>	abundant				
<i>Smuts / Rusts / Myxomycetes</i>	trace				
Unknown Mitospores	abundant				
Other:					
Other:					
Other:					
Hyphal Fragments			abundant		
Other:					
Pollen					
Fibers					
Particles					
Total Mold Spores	abundant	significant	abundant	minor	abundant

Comments:



Analyzed by: Jennifer Fuld
Microscopist

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Partner with the U.S. Environmental Protection Agency in establishing Indoor Air Quality guidelines and protocol

For Decontamination or Microbial Investigative Services

www.IAQM.com

Definitions and Pathogenicity of Organisms Found

Alternaria sp. This fungus is a large universally occurring genus. Several form-species are found as saprophytes on dead and dying plant parts. Conidia of this fungus are easily carried by the wind. Commonly found in house dust, carpets, textiles, and on horizontal surfaces in building interiors and is one of the main fungal causes of allergy. Outdoors, it may be isolated from samples of soil, seeds and plants, and is frequently reported in air. The large spore size suggests that the spores from this fungus will deposit in the nose, mouth and upper respiratory tract causing nasal septum infections. It has also been associated with hypersensitivity pneumonitis. It is a common cause of extrinsic asthma. Acute symptoms include edema and bronchi spasms; chronic cases may develop pulmonary emphysema. Baker's asthma is associated with inhalation of *Alternaria* conidia present in flour. Farmer's lung type of allergy has also been reported recently. Other diseases caused by *Alternaria* include mycotic keratitis, skin infections, and osteomyelitis. Also, the species *Alternaria alternata* is capable of producing tenuazonic acid and other toxic metabolites that may be associated with disease in humans or animals. Several species of *Alternaria* are pathogenic to plants.

Aspergillus / Penicillium sp. - They are important causes of food spoilage, grain deterioration, and toxin production. Both *Aspergillus* and *Penicillium* are known as inhalant allergens and some species can cause systemic infections and mycotoxicoses. They also play important roles in industrial fermentations for antibiotics, cheese production, and numerous fermented foods.

Basidiospores – An allergen / contaminant, a general class of spore formed on a structure known as a basidium, characteristic of the Basidiomycete class (that includes rusts, smuts and mushrooms). This category is commonly found in outdoor air samples. Many species are reported to be allergenic and some species are associated with dry rot in wood. Elevated airborne concentrations indoors might be indicative of water damage or too high of humidity.

Chlamydospores – A thick-walled, asexual, resistant spore: They develop like holothallic conidia, but their function is survival rather than propagative. Considered a possible allergen.

Cladosporium sp. - common allergen / contaminant / very rarely pathogenic, found everywhere, many times the most common and numerous mold found in outdoor air. Indoor concentrations are usually not as high, but it is an important airborne allergen and common agent for hay fever, asthma, and other allergy related symptoms. It can thrive in various indoor environments, appearing light green to black (the black mold on air vent grills is usually *Cladosporium*).

Hyphae - The principal element of the growing or vegetative form of a mold (filamentous fungi), characterized by branching tube-like growth.

Mitospores / Hyphomycetes – A group of fungi constituting the second largest fungi group. *Mitospores / Hyphomycetes* Corresponds to a class of conidial fungi characterized by the formation of asexual spores (conidia) on conidiophores that are not contained in a fruiting body. Many are considered contaminants and allergens.

Pithomyces / Ulocladium sp. These fungi are found mainly growing on decaying plants, especially grasses. Some species can be also found on dead herbaceous plants, rotten woods, paper, textiles, and other organic substrates (cellulose), such as water-damaged building materials. *Ulocladium* is also found in dust and air samples. They are known to be common airway allergens.

Smuts / Rust / Myxomycetes - general category for commonly found genera usually associated with living and decaying plants as well as decaying wood. Sometimes can be found indoors. Some allergenic properties reported, but generally pose no health concerns to humans or animals.

Stachybotrys sp. - *Stachybotrys* thrives on water damaged cellulose rich materials such as sheet rock, paper, ceiling tiles, cellulose containing insulation backing and wallpaper. The presence of this fungus in buildings is significant because of the mold's ability to produce mycotoxins, which are extremely toxic, such as Satratoxin H. Exposure to these toxins can occur through inhalation, ingestion or dermal exposure. Symptoms include dermatitis, cough, rhinitis, nose bleeds, a burning sensation in the mouth and nasal passage, cold and flu symptoms, headache, general malaise, and fever. Inhalation of conidia may also induce pathological changes (pneumomycotoxicoses). Satratoxin H has been reported to be abortogenic in animals and in high doses or chronic low doses it can be lethal. *S. chartarum* produces other macrocyclic and trichoverroid trichothecenes and, like *Memnoniella echinata*, produces phenylspirodrimanes, which are immunosuppressive. *Stachybotrys* typically appears as a sooty black fungus occasionally accompanied by a thick mass of white mycelia. As a general rule, air sampling for *Stachybotrys* yields unpredictable results mainly due to the fact that this fungus is usually accompanied by other fungi such as *Aspergillus* and *Penicillium* that normally are better aerosolized than *Stachybotrys*. ***Memnoniella sp.*** Cellulolytic fungus very closely related to *Stachybotrys* and now considered a species of *Stachybotrys*.