

# Air Allergen & Mold Testing, Inc.

2041 Hessian Court  
 Stone Mountain, Ga. 30087  
 Phone (770) 938-4861 Fax (770) 270-0853

**Report #**     040510-003

**Report Date:**    4/6/2010  
**Analyzed by:**    rb

**Consultant / Contact:** Air Allergen  
**Attention:** Rich Johnson  
**Address:** 2041 Hessian Ct  
 Stone Mountain, Ga. 30087

**Project:**

**Analysis of Linear Spore Trap Samples  
 by SOP AAMTDX001**

AAMT Test #	040510-003-01	040510-003-02	040510-003-03
Customer Sample #			
Spore Trap Serial #	15803767	15804446	15803745
<b>Location</b>	Basement	Main Level	Upstairs Bedroom
Volume (L)	75	75	75

Skin Fragments %	0-25	0-25	26-50
Background / m <sup>3</sup>	Overloaded	Overloaded	Overloaded
Hyphae / m <sup>3</sup>	83	456	415

		Raw Count	Spores/m <sup>3</sup>	% Total	Raw Count	Spores/m <sup>3</sup>	% Total	Raw Count	Spores/m <sup>3</sup>	% Total
Predominantly Outside	Alternaria	2	83	0.2	1	41	1.8	1	41	4.5
	Arthrinium									
	Arthrospores									
	Ascospores	2	83	0.2	6	249	10.9	9	373	40.9
	Basidiospores	172	32,107	76.8	33	1,369	60.0	8	332	36.4
	Bipolaris									
	Curvularia									
	Epicoccum				2	83	3.6			
	Nigrospora									
	Periconia/Myxomycete				4	166	7.3			
	Pithomyces									
	Spegazzinia									
	Tetraploa				1	41	1.8			
	Torula									
Urediniospores										
Pyricularia								1	41	4.5
Inside / Outside	Aspergillus/Penicillium	102	9,520	22.8	7	290	12.7	1	41	4.5
	Cladosporium				1	41	1.8	2	83	9.1
Water Damage	Chaetomium									
	Stachybotrys									
	Trichoderma									
	Ulocladium									
<b>Total</b>		<b>278</b>	<b>41,793</b>	<b>100</b>	<b>55</b>	<b>2,281</b>	<b>100</b>	<b>22</b>	<b>913</b>	<b>100</b>

Please see attached sheet for additional information and important notes.  
 Limit of Detection @ 600x                    41  
 Limit of Detection @ 300x                    13  
 Background / m<sup>3</sup> is a combination of debris, skin and fibers.

Richard Billups  
 Laboratory Director

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## Project:

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### Background and Fiber Analysis

<b>AAMT Test #</b> <b>Location</b>	040510-003-01 Basement	<b>Particles</b>	Gypsum board		
		<b>Fibers</b>	Insulation	Cellulose	
<b>AAMT Test #</b> <b>Location</b>	040510-003-02 Main Level	<b>Particles</b>	Gypsum board	Soil	Carbon
		<b>Fibers</b>	Insulation	Cellulose	
<b>AAMT Test #</b> <b>Location</b>	040510-003-03 Upstairs Bedroom	<b>Particles</b>	Gypsum board	Carbon	
		<b>Fibers</b>	Insulation	Cellulose	

**Other observations:**

Sample 1 Basement overloaded with debris. Appears to be mainly gypsum board (>500,000/m<sup>3</sup>). Piece of wood observed that indicates active wood rot.

Sample 2 Main Level overloaded with debris. Appears to be mainly gypsum board (>500,000/m<sup>3</sup>). Pollen count 539 / m<sup>3</sup>.

Sample 3 Upsairs Bedroom overloaded with debris. Appears to be mainly gypsum board (>500,000/m<sup>3</sup>). Pollen count 269/m<sup>3</sup>.

## How To Read Our Reports

	AAMT Test #			
	Customer Sample #			
	Spore Trap Serial #			
	<b>Location</b>			
	Volume (L)	75		← Amount of Air sampled, out of 1000 Liters
	Skin Fragments %	26-50		
	Background / m <sup>3</sup>	126,853		← Total particles in 1 cubic meter of air (1000 liters)
	Hyphae / m <sup>3</sup>	1067		
	<b>Spore Name</b>	<b>Raw Count</b>	<b>Spores/m</b>	<b>% Total</b>
Predominantly Outside	Alternaria	2	83	0.4
	Arthrinium			
	Arthrospores			
	Ascospores			
	Basidiospores			
	Bipolaris			
	Curvularia			
	Epicoccum			
	Nigrospora	5	207	0.9
	Periconia/Myxomycete			
	Pithomyces			
	Spegazzinia			
	Tetraploa			
Torula				
Urediniospores				
Inside / Outside	Aspergillus/Penicillium	400	16,593	73.1
	Cladosporium	127	5,268	23.2
Water Data	Chaetomium	10	415	1.8
	Stachybotrys	3	124	0.5
	Trichoderma			
	Ulocladium			
	<b>Total</b>	547	22,690	100

Please see attached sheet for additional information.

Limit of Detection @ 600x	41	← Each spore counted by the analyst represents this many spores at one cubic meter, at the specified magnification
Limit of Detection @ 300x	13	

## How to Read Our Reports

1. Notice that the major groups of spores are separated into Inside / Outside and Predominantly Outside and Water damage.

This is to make it easier to compare important groupings on the report.

2. The spore types, as well as the number identified is important. High levels of *Aspergillus* / *Penicillium*, and any level of the Water Damage organisms should be of concern.
3. The Outside, or Background sample is used to verify that the sampling equipment is operating correctly. The Outside sample can also be used to determine if the HVAC is operating correctly and as a comparison to the spores recovered inside.
4. The background is represented as particles per cubic meter. The higher the number of particles the more likely that the HVAC is not operating correctly, or there may be overcrowding in the room. High levels of particles can also be an indicator of poor air quality that can lead to respiratory irritation.
5. Skin fragments are common in the indoor air. Again, as the % of fragments rise, the more chance that it may be indicating poor circulation or overcrowding.
6. Particles and Fibers are identified on page 2 of the report. If there is something important to note about the fibers or if dust mite parts are observed, it will be noted here.
7. Hyphae are analogous to the stem of a plant. The spores arise from the hyphae, therefore, hyphae should be taken into account when looking at the total spore count, although they are not a part of that number. Hyphae can also give rise to new fungus growth in HVAC systems and carpeting.
8. The spore types are explained in the Organism section of the report.
9. The Limit of Detection is equal to one spore counted by the analyst divided by the inverse of the volume sampled and by the percent of the slide analyzed. If the detection limit is 41, it means that if there are 41 spores of that type in 1 cubic meter of air, that reading 30% of the slide at 600x (magnification) will result in a raw count of 1.

Organism		Recovered From	Comments	Inside / Outside	High Water Activity	Mycotoxins	Health Risk	Found in
Genus	Species							
<a href="#">Acremonium</a>	<i>species</i>	soil, dead leaves, carpet, gypsum board	generally recovered in large numbers	Often recovered from water damaged inside wall	YES	NO	keratitis, mycetoma, aspergillosis	<i>Stachybotrys, Chaetomium, Trichoderma, Aspergillus, Penicillium</i>
<a href="#">Alternaria</a>	<i>alternata</i>	carpet and air. Mostly an outside spore on plants and in soil	occurs in small amounts	OUT	YES	YES	phaeohyphomycosis, infections of bone, cutaneous tissue, ears, eyes, paranasal	<i>Bipolaris, Curvularia, Cladosporium, Pithomyces, Epicoccum, Drechslera, Exserohilum, Helminthosporium</i>
<i>Arthrinium</i>	<i>species</i>	soil, forest litter, plant materials, decaying wood, decaying wood in crawl spaces	not often occurring inside, generally outside in moderate numbers. Often found on decaying wood in crawl spaces	OUT		NO	NA	<i>Curvularia, Bipolaris, Cladosporium, Pithomyces, Epicoccum</i>
Ascospores		wide variety of substrates. Plant, soil, air, cellulose materials, wood in crawl spaces	at certain times of year, found in large numbers outside	OUT	<i>Chaetomium globosum, Eurotium species</i> - YES. Most other genera and species, NO	dependent on genus or species recovered	Not generally involved with human disease.	<i>Basidiospores (if outside), not generally recovered on laboratory media.</i>
<a href="#">Aspergillus</a>	<i>species</i>	soil, food, air, carpet, HVAC	Large amounts when recovered	BOTH	YES several species	YES several species	aspergillosis, allergy	<i>Penicillium</i>
<i>Aspergillus</i>	<i>versicolor</i>	HVAC, insulation, carpet, air	Must be < 1. Not tolerated at any level inside.	NA	NA	YES	aspergillosis	<i>Aspergillus sydowii, Aspergillus fumigatus, Aspergillus usuts</i>
<i>Aspergillus (Neosartorya)</i>	<i>fumigatus (fischeri)</i>	Air, Carpet, HVAC	Must be < 1. Not tolerated at any level inside.	NA	NA	YES	Respiratory pathogen. Most often cause of Aspergillosis	<i>Cladosporium, Aspergillus versicolor, bacteria, Aspergillus sydowii, Aspergillus niger,</i>
<a href="#">Aureobasidium</a>	<i>pullulans</i>	food, indoor, soil, leaf, seeds, fruit drinks, carpet, wet areas		INSIDE	YES	NO	corneal, peritoneal, cutaneous, pulmonary, systemic mycosis	<i>yeasts, Chaetomium, Stachybotrys, Trichoderma, Aspergillus, Penicillium</i>
<a href="#">Basidiospores</a>		soil, wood, cellulose materials, plywood when wet	large amounts	OUTSIDE	YES	NO for air, YES for some mushrooms	NONE from air. Some mushrooms ingested can contain dangerous toxins	Ascospores, recovered on laboratory media as sterile mycelium, sometimes with "clamps" and/or arthrospores
<i>Chaetomium</i>	<i>Species</i>	Ascospore commonly associated with wet gypsum board. Present in soil	Large amounts when recovered	INSIDE	YES	NO	occasionally associated with infections of blood, brain, skin and nails	<i>yeasts, Stachybotrys, Trichoderma, Aspergillus, Penicillium</i>
<a href="#">Cladosporium</a>	<i>species</i>	plant material, soil, indoor air, carpet, HVAC		BOTH	NO	NO	NA	<i>Alternaria, Curvularia, Pithomyces, Epicoccum, Drechslera, Exserohilum, Helminthosporium</i>

Organism		Recovered From	Comments	Inside / Outside	High Water Activity	Mycotoxins	Health Risk	Found in
Genus	Species			Spore Type	Indicator	Produced	Type	Combination with
<i>Curvularia</i>	<i>species</i>	soil, plant material, carpet, cellulose materials (paper)		BOTH			opportunistic pathogen of cornea and sinuses. Related to keratitis, endocarditis, mycetoma and pulmonary infection.	<i>Alternaria, Cladosporium species Pithomyces, Epicoccum, Drechslera, Exserohilum, Helminthosporium</i>
<a href="#"><u>Epicoccum</u></a>	<i>nigrum</i>	plants, soil, carpet, air, seeds	generally recovered in small numbers	primarily outside but is common inside, as well.	NO	NO	None	<i>Alternaria, Curvularia, Cladosporium species, Pithomyces, Drechslera, Exserohilum, Helminthosporium</i>
<a href="#"><u>Fusarium</u></a>	<i>species</i>	grains, soils, apples, potatoes, sugar beet, maize	few, when recovered	BOTH	NO	YES several species	keratitis, occasionally mycetoma, sinusitis, septic arthritis and onychomycosis. Contains highly toxic secondary metabolites when ingested in some food grains.	<i>Aspergillus, Penicillium, Acremonium, Epicoccum</i>
<i>Microsporium</i>	<i>species</i>	human and animal scalp, skin, nails	rarely recovered in air samples	IN	NO	NO	dermatophyte. Ringworm, infections of skin, scalp and nails	<i>Trichopyton, Epidermophyton</i>
Myxomycete		plant pathogen	low, outside	OUTSIDE	NO	NO	NO	seen at various times of the years outside with a combination of other outside spores
<i>Nigrospora</i>	<i>species</i>	carpet, air, soil, plants		BOTH	NO	NO	None	<i>Alternaria, Cladosporium species Pithomyces, Epicoccum, Drechslera, Exserohilum, Helminthosporium</i>
<i>Periconia</i>	<i>species</i>	plant pathogen	low, outside	OUTSIDE	NO	NO	NO	seen at various times of the years outside with a combination of other outside spores
<i>Pithomyces</i>	<i>species</i>	soil, air, plant material	at certain times of the year can be recovered in moderate amounts from outside air	OUTSIDE	NO	NO	NONE	<i>Alternaria, Cladosporium species, Epicoccum, Drechslera, Exserohilum, Helminthosporium</i>

Organism		Recovered From	Comments	Inside / Outside Spore Type	High Water Activity Indicator	Mycotoxins Produced	Health Risk Type	Found in Combination with
Genus	Species							
<i>Pyricularia</i>	<i>Species</i>	soil, plant		OUTSIDE	NO	NO	NONE	seen at various times of the years outside with a combination of other outside spores
<i>Spegazzinia</i>	<i>species</i>	soil, plants	very small numbers outside	OUTSIDE	NO	NO	NO	seen at various times of the years outside with a combination of other outside spores
<i>Stachybotrys (Memnoniella)</i>	<i>chartarum (echinata)</i>	Most often actively growing on the backside of gypsum board. Carpet, HVAC provide sparse growth and sometimes only spores	Must be < 1. Not tolerated at any level inside, although individual spores are occasionally brought in on shoes from the soil.	Most often recovered inside	YES	YES	Neurotoxic. Toxins are damaging to organs but the spores do not grow at body temperature.	<i>Chaetomium, Trichoderma, Acremonium, Ulocladium, Aspergillus usuts</i>
<i>Stemphylium</i>	<i>species</i>	soil, grass, wood, paper	in small numbers outside	OUTSIDE	NO	NO	NONE	<i>Alternaria, Cladosporium species, Epicoccum, Drechslera, Exserohilum, Helminthosporium, Curvularia, Pithomyces, Bipolaris</i>
<i>Tetraploa</i>	<i>species</i>	plant material	very small numbers outside	OUTSIDE	NO	NO	NO	seen at various times of the years outside with a combination of other outside spores
<i>Torula</i>	<i>species</i>	soil, plants	very small numbers outside	OUTSIDE	NO	NO	NO	seen at various times of the years outside with a combination of other outside spores
<i>Trichoderma</i>	<i>species</i>	soil, plant material, carpet, cellulose materials (paper), decaying wood	clumps of green spores in large numbers	BOTH	YES	NO	<i>T. viride</i> is associated with aspergillosis. <i>T. harzianum</i> is associated with hypersensitivity pneumonitis	<i>Aspergillus, Penicillium, Chaetomium, Acremonium, Stachybotrys</i>
<i>Trichophyton</i>	<i>species</i>	human and animal scalp, skin, nails	rarely recovered in air samples	IN	NO	NO	dermatophyte. Ringworm, infections of skin, scalp and nails	<i>Microsporum, Epidermophyton</i>
<i>Ulocladium</i>	<i>species</i>	soil, grass, wood, paper	in small numbers outside, moderate inside	BOTH	YES	NO	NONE	<i>Aspergillus, Penicillium, Chaetomium, Acremonium, Stachybotrys</i>
Uredinospores (Rusts)		plant pathogen	variable in numbers produced	OUTSIDE	NO	NO	NO	seen at various times of the years outside with a combination of other outside spores

## GLOSSARY

<p><b>Aspergillosis</b></p>	<p>refers to any species of the genera <i>Aspergillus</i> and <i>Penicillium</i> that can infect the respiratory tract, sinuses, ear, eye, skin, mucous membranes and multiple systemic sites. The most common cause of aspergillosis is <i>Aspergillus fumigatus</i> and <i>Aspergillus flavus</i></p>
<p><b>Ascomycetes (ascospores)</b></p>	<p>a class of fungi characterized by the presence of <a href="#">asci</a> and spores, and having two distinct reproductive phases, a perfect stage and an <a href="#">imperfect stage</a>. Outside, mainly found as plant pathogens.</p>
<p><b>Basidiomycetes (basidiospores)</b></p>	<p>the largest class of fungi the Basidiomycota has been divided into 2 classes, <a href="#">mushrooms</a>, and the <a href="#">jelly</a>, <a href="#">rust</a> and <a href="#">smut</a> fungi). Major contributor to wood rot.</p>
<p><b>Chromoblastomycosis</b></p>	<p>granulomatous inflammation with suppurative reaction, generally superficial and/or subcutaneous.</p>
<p><b>Dermatophyte</b></p>	<p>a fungus belonging to the genus, <i>Trichophyton</i>, <i>Epidermophyton</i> or <i>Microsporum</i>, with the ability to obtain nutrients from keratin and infect skin, hair, or nails of humans or animals.</p>
<p><b>Hyalohyphomycosis</b></p>	<p>saprophytic fungi that produce colorless hyphae</p>



<b>Keratitis</b>	inflammation of the cornea of the eye
<b>Mycetoma</b>	a localized, chronic cutaneous or subcutaneous infection classically characterized by draining sinuses, granules and swelling.
<b>Mycosis</b>	disease caused by a fungus
<b>Myxomycetes (slime mold)</b>	A class of peculiar organisms, the slime molds, formerly regarded as animals (Mycetozoa), but now generally thought to be plants and often separated as a distinct phylum (Myxophyta); essentially equivalent to the division Myxomycota. They are found on damp earth and decaying vegetable matter, and consist of naked masses of protoplasm, often of considerable size, which creep very slowly over the surface and ingest solid food.
<b>Onychomycosis</b>	a fungal infection that affects the fingernails or toenails
<b>Phaeohyphomycosis</b>	saprophytic fungi that produce dark brown to black hyphae and infect the skin and may also be subcutaneous.
<b>Sinusitis</b>	is inflammation of the lining membrane of any of the hollow areas (sinuses) of the bone of the skull around the nose. The sinuses are directly connected to the nasal cavities.
<b>Sterile Mycelium</b>	hyphae that have an absence of spores or conidia

<b>Subcutaneous</b>	situated or occurring directly under the skin
<b>Suppurative</b>	producing puss
<b>Uredinospores (Rusts)</b>	are the thinner-walled <a href="#">spores</a> of some <a href="#">fungi</a> : ( <a href="#">rusts</a> and <a href="#">smuts</a> ), from which the <a href="#">basidium</a> arises. Plant pathogens.
<b>Zygomycosis</b>	infection caused by opportunistic fungi of the zygomycete group ( <i>Rhizopus</i> , <i>Mucor</i> , <i>Rhizomucor</i> , <i>Absidia</i> , <i>Sycephalastrum</i> , <i>Cunninghamella</i> )

## References

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Larone, D. L. Medically Important Fungi, A Guide to Identification. 4<sup>th</sup> Ed. ASM Press. Washington, D.C. 2002

Murray, P.R., Baron, J.B, Pfaller, F.C., Tenover, R. H. Manual of Clinical Microbiology. 6<sup>th</sup> Ed. ASM Press. Washington, D.C. 1995.

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