

## Data, Interpretation and Recommendations of Indoor Mold Testing & Laboratory Analysis

**Project Name:** Salomon Behar 7B, PH Aquamare, Panama Pacifico, Panama City  
**Sampling Date:** 04-29-2019  
**Sample Received:** 05/01/2019 **Data Reported:** 05/03/2019

### Summary & Assessment

1. The air sample tests follow typical expectations that the outdoor airborne mold count is considerably higher than the indoor test results.  
**>>> This indicates a well-maintained indoor environment (outdoor counts higher than indoor).**
2. The indoor results are relatively consistent across the three locations tested,  
**>>>This indicates that there is likely no single mold location producing airborne spores.**
3. Indoor airborne mold spores are in ranges of relatively "clean" indoor space, highest count is for Aspergillus/Penicillium-like and Basidiospores species. We would expect any on-going active mold growth caused by moisture intrusion to be putting out increased spore counts and a distinct species picture different from outdoor and other areas. we do not see tis from the test results.  
**>>> This indicates that although there are likely no active mold spore producing locations, there is still airborne mold in the indoor air**
4. Despite the low airborne mold spore counts, the resident and our personnel still notice a mold smell and have reactions while in the residence.  
**>> This is indicative that highly likely that the mold presence prior to treatment has caused "Mold-related volatile organic compounds" , known as mold smell gas, and ties mVOC's have built up and are likely causing some symptoms unrelated to mold spores/fragments.**

### Recommendations:

1. Utilize a commercial / industrial Air Scrubber with high-grade HEPA filter to circulate the air within the residence and remove as much of the residual mold spores as possible. Recommend running 24 hrs for 3 days in the bedroom area, the living room and the bar area.
2. Purchase three residential grade Air Purifiers, one for bedroom, one for living room and one for bar area. The units MUST be equipped with a HEPA filter with efficiency rating of 99.97% or higher, and have multi-stage filtration. These units will help with continuous air circulation and get the airborne mold counts even lower. This will be critical for when rain season starts. Here are some suggestions, we have never seen HEPA filter units in Panama. <https://thewirecutter.com/reviews/best-air-purifier/>
3. Monitor the previous moisture intrusion problem in the bedroom diligently. Consider use of a humidity moisture logger in the space above the gyproc ceiling in the bedroom closet area. Continue use of the dehumidifier in the bedroom area and we suggest that an exhaust fan system be installed in the bathroom area.

Fungal Identification	Exterior		Bar Room		Living Room		Bedroom	
	Spores/m3	%	Spores/m3	%	Spores/m3	%	Spores/m3	%
Ascospores	189	2%					7	4%
Aspergillus/Penicillium-like	8,001	73%	322	47%	168	57%	105	56%
Basidiospores	1,659	15%	105	15%	70	24%	35	19%
Cladosporium	567	5%	175	26%	14	5%		
Ganoderma	77	1%					7	4%
Myxomycetes/Periconia/Rust/Smu	28	3%					7	4%
Other hyaline spores				6%		1%		7%
Hyphal Fragments								7%
TOTAL Fungal/Mold	10,498		686		294		189	
Pollen/m <sup>3</sup>	84		14		21		0	
Insect or dust mite parts/m <sup>3</sup>								
General Density	76-100%		26-50%		26-50%		26-50%	

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Typical Outdoor Mold Spore Concentrations, typically always much higher than indoors		
Local Description	Spore Counts (ct/m <sup>3</sup> )	Predominant Types
Urban & coastal strip	200 - 10,000	Cladosporium, asco/basidiospores, Alternaria, Penicillium, Aspergillus
<b>Inland valley &amp; native vegetation</b>	<b>500 - 20,000</b>	<b>Cladosporium, asco/basidiospores, Penicillium, Aspergillus</b>
Farms & heavy forestation	5,000 - 50,000	Cladosporium, asco/basidiospores, Alternaria, Penicillium, Aspergillus

Outdoor assemblages of mold spores are most commonly populated with over 90% of the following spores (listed in approximate order of descending abundance):

- Cladosporium
- Mushroom-like fungi (Ascospores and Basidiospores)
- Alternaria
- Rusts and Smuts (colonizing primary flower and leaf parts)

Typical Indoor Mold Spore Concentration Ranges		
<b>"Clean" building</b>	<b>&lt;2,000 Total for all spore types</b> <b>&lt;700 Penicillium, Aspergillus</b>	
Possible Indoor Amplification	1,000 - 5,000	Penicillium, Aspergillus, Cladosporium
Indoor Amplification likely present	5,000 - 10,000	Penicillium, Aspergillus, Cladosporium
Chronic Indoor Amplification	10,000 - 500,000	Penicillium, Aspergillus, Cladosporium

The most common molds susceptible to indoor amplification (over 90% of the typical mold growth) (listed in approximate order of descending abundance)

- Penicillium
- Aspergillus (flavus, fumigatus, terrus, versicolor, niger)
- Cladosporium
- Stachybotrys
- Alternaria, Chaetomium
- Zygomycetes (Mucor & Rhizopus)
- Ulocladum, Trichoderma
- Basidiomycete fungi

Aspergillus, acremonium and stachybotrys are the most dangerous and need immediate removal.



# Laboratory Analysis Report

## Data Sheet

Aemtek No. 1905006

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Project ID: Salomon Behar  
 Project Location: 7B, PH Aquamare, Panama Pacifico, Panama City, Panama  
 Analysis Performed: Fungal Direct Examination (FDE)  
 Sample Type: Air

Submitted to:  
 Industrial Solutions & Supply Corp  
 Panama City,

Sample ID Location	2019042901 Exterior Table on Patio			2019042902 "Bar" Room			2019042903 Living Room			2019042904 Bedroom Area, Closet Location		
	Count	Spores/m <sup>3</sup>	%	Count	Spores/m <sup>3</sup>	%	Count	Spores/m <sup>3</sup>	%	Count	Spores/m <sup>3</sup>	%
Air Volume (L)	150			150			150			150		
Fungal Identification												
<i>Alternaria</i>	1	7	-	-	-	-	-	-	-	-	-	-
Ascospores	27	189	2	-	-	-	-	-	-	1	7	4
<i>Aspergillus/Penicillium</i> -like	1143	8001	73	46	322	47	24	168	57	15	105	56
Basidiospores	237	1659	15	15	105	15	10	70	24	5	35	19
<i>Bipolaris/Dreschlera</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Botrytis</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cercospora</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cladosporium</i>	81	567	5	25	175	26	2	14	5	-	-	-
<i>Curvularia</i>	2	14	-	-	-	-	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ganoderma</i>	11	77	1	-	-	-	-	-	-	1	7	4
<i>Myxomycetes/Periconia/Rust/Smut</i>	4	28	-	-	-	-	-	-	-	1	7	4
<i>Nigrospora</i>	1	7	-	2	14	2	-	-	-	-	-	-
<i>Oidium</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Petriella</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pithomyces</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stachybotrys</i>	1	7	-	-	-	-	-	-	-	-	-	-
<i>Stemphylium</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Torula</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Trichoderma</i> -like	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ulocladium</i>	-	-	-	-	-	-	-	-	-	-	-	-
Other hyaline spores	46	322	3	6	42	6	4	28	10	2	14	7
Other colored spores	2	14	-	1	7	1	-	-	-	-	-	-
Hyphal fragments	8	56	1	3	21	3	2	14	5	2	14	7
<b>Total</b>	<b>1564</b>	<b>10948</b>	<b>100</b>	<b>98</b>	<b>686</b>	<b>100</b>	<b>42</b>	<b>294</b>	<b>100</b>	<b>27</b>	<b>189</b>	<b>100</b>
Pollen/m <sup>3</sup>	84			14			21			-		
Insect or dust mite parts/m <sup>3</sup>	-			-			7			-		
Detection Limit (spores/m <sup>3</sup> )	76-100%			7			7			26-50%		
General Density	100%			100%			100%			100%		
% of Trace Analyzed												

Method ID: Aemtek SOP AF101  
 Sampling Date: 04-29-2019  
 Analysis Performed By: Thomas Giang  
 Date of Analysis: 05-03-2019

Direct microscopy detection limit: One spore or one hyphal Fragment per sample.

Reviewed By:

*Brook Liu*