



# HYGIENETECH

Hygiene Technologies International, Inc.

3625 Del Amo Boulevard, Suite 180  
Torrance, California 90503-1643  
(310) 370-8370  
(310) 370-7026 FAX  
www.hygienetech.com

March 22, 2016

California State Board of Equalization  
450 N Street  
Sacramento, California 94279

Document No. 21603001.2

Attention: Vince Paul

Regarding: 9<sup>th</sup> Floor Cubicle 56

Dear Mr. Paul:

On March 18, 2016, Lakhpreet Sandhu, Industrial Hygienist, with Hygiene Technologies International, Inc., (HygieneTech), visited the Cubicle 56 area on the south side of the 9<sup>th</sup> floor to perform exposure potential air sampling for total fungi at the request of the California State Board of Equalization (BOE) in response to an employee concern regarding indoor air quality at that location. The survey findings, along with the analytical data and conclusions, appear below.

On the survey date, air samples were collected for total (viable and nonviable) fungi analyses using a Zefon brand Bio-Pump™ equipped with Air-O-Cell® cassettes. The samples were subsequently analyzed for fungi (including yeasts, molds, rusts, smuts, and mushrooms) by trained and experienced microbiologists at a laboratory accredited by the American Industrial Hygiene Association (AIHA) and that successfully participates in the AIHA Environmental Microbiology Proficiency Analytical Testing (EMPAT) Program. The airborne fungi assessment analytical data with supporting and background information appear in the enclosed table.

As presented in Table 21603001-2, the airborne spore count datum recorded outdoors showed fungal spore types such as *Alternaria*, ascospores, basidiospores, *Cladosporium*, colorless spores typical of *Penicillium* and *Aspergillus* species, *Oidium*, rusts, and smuts, with basidiospores predominating. In the indoor area tested, the datum showed that airborne fungal spores were detected at low airborne concentrations. The fungal spore types found indoor included *basidiospores* and *Cladosporium*. The distribution of fungal spore types detected in the surveyed area was consistent with those found outdoors and the overall datum within the tested area was well below the overall outdoor datum recorded. These data are considered unremarkable and are not believed to pose a health risk beyond that posed by the outdoor environment where exposures to airborne fungi are expected.

Be advised that the data provided in this report only represent limited fungal growth exposure potentials that existed at the time the survey was performed and at the precise sample location indicated, the latter of which were selected based on the available background information provided. Note that fungal growth exposure potentials may change due to changes in environmental conditions (such as those caused by water intrusion), use of mechanical systems, or other factors.

Mr. Vince Paul  
March 22, 2016  
Document No. 21603001.2 – 9<sup>th</sup> Floor Cubicle 56  
Page 2



If you have any comments or questions regarding the information contained in this correspondence, please feel free to contact our offices directly at (310) 370-8370.

Sincerely,

**HYGIENE TECHNOLOGIES INTERNATIONAL, INC.**

A handwritten signature in black ink, appearing to read 'Kenny K. Hsi', is written over a horizontal line.

Kenny K. Hsi, CIH  
Technical Director

# HYGIENE TECHNOLOGIES INTERNATIONAL, INC.

# APPENDIX A



CLIENT: California State Board of Equalization  
450 N Street  
Sacramento, California 94279

TABLE 21603001-2  
AIRBORNE TOTAL FUNGI RESULTS  
9<sup>TH</sup> FLOOR  
450 N STREET  
SACRAMENTO, CALIFORNIA  
MARCH 18, 2016

## Results reported in spores per cubic meter of air (spores/M<sup>3</sup>)

SAMPLE NUMBER	21603001-2 TM01OUT	21603001-2 TM02		
<b>SAMPLING LOCATION/ACTIVITIES</b>	Outdoors; about 25 feet northeast of the main entrance of building; approximately five feet above ground/Normal outdoor activities	9 <sup>th</sup> Floor; Column J21 area; Cubicle 56; about center; approximately five feet above floor/Normal office activities	This column intentionally left blank	This column intentionally left blank
<b>START/STOP</b>	16:18:00/16:23:00	16:26:00/16:31:00		
<b>SAMPLE TIME</b>	5 minutes	5 minutes		
Alternaria	67			
Ascospores	850			
Basidiospores	4,100	110		
Botrytis				
Chaetomium				
Cladosporium	1,400	53		
Curvularia				
Epicoccum				
Myrothecium				
Nigrospora				
Oidium	27			
Other brown				
Other colorless				
Penicillium/Aspergillus types	530			
Pithomyces				
Rusts	13			
Smuts (Periconia, Myxomycetes)	13			
Spegazzinia				
Stachybotrys				
Torula				
Ulocladium				
Zygomycetes				
Hyphal fragments	67	<13		
Background debris*	2+	3+		
<b>TOTAL**</b>	7,000	160		

\*Background debris is an indication of the amount of non-biological particulate matter present on the slide and is graded (from least to greatest) as 1+ to 4+.

\*\*Note that all reported counts have been rounded to no more than two significant figures based on the sampling and analytical methods used, and therefore the total count may not equal the sum of the individual counts in a column.





Report for:

**Mr. Kenny Hsi, Mr. Lakhpreet Sandhu**  
**Hygiene Technologies International, Inc.**  
3625 Del Amo Boulevard, Suite 180  
Torrance, CA 90503-8370

---

Regarding: Project: 21603001-2; 9th Floor Air Sampling  
EML ID: 1511403

Approved by:

Dates of Analysis:  
Spore trap analysis: 03-21-2016

Technical Manager  
Louise White

Service SOPs: Spore trap analysis (EM-MY-S-1038)  
AIHA-LAP, LLC accredited service, Lab ID #179768

---

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. Due to the nature of the analyses performed, field blank correction of results is not applied. The results relate only to the items tested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

EMLab P&K's LabServe® reporting system includes automated fail-safes to ensure that all AIHA-LAP, LLC quality requirements are met and notifications are added to reports when any quality steps remain pending.

Client: Hygiene Technologies International, Inc.  
C/O: Mr. Kenny Hsi, Mr. Lakhpreet Sandhu  
Re: 21603001-2; 9th Floor Air Sampling

Date of Sampling: 03-18-2016  
Date of Receipt: 03-18-2016  
Date of Report: 03-21-2016

**SPORE TRAP REPORT: NON-VIABLE METHODOLOGY**

Location:	21603001-2TM01OUT		21603001-2TM02	
Comments (see below)	None		None	
Lab ID-Version‡:	6991849-1		6991850-1	
Analysis Date:	03/21/2016		03/21/2016	
	raw ct.	spores/m <sup>3</sup>	raw ct.	spores/m <sup>3</sup>
Alternaria	5	67		
Ascospores	16	850		
Basidiospores	77	4,100	2	110
Chaetomium				
Cladosporium	26	1,400	1	53
Curvularia				
Epicoccum				
Fusarium				
Myrothecium				
Nigrospora				
Oidium	2	27		
Other colorless				
Penicillium/Aspergillus types†	10	530		
Pithomyces				
Rusts	1	13		
Smuts, Periconia, Myxomycetes	1	13		
Stachybotrys				
Stemphylium				
Torula				
Ulocladium				
Zygomycetes				
Background debris (1-4+)††	2+		3+	
Hyphal fragments/m <sup>3</sup>	67		< 13	
Pollen/m <sup>3</sup>	3,100		53	
Skin cells (1-4+)	< 1+		2+	
Sample volume (liters)	75		75	
<b>§ TOTAL SPORES/m<sup>3</sup></b>		<b>7.000</b>		<b>160</b>

**Comments:**

Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample, indicating a raw count of <1 spore.

† The spores of *Aspergillus* and *Penicillium* (and others such as *Acremonium*, *Paecilomyces*) are small and round with very few distinguishing characteristics. They cannot be differentiated by non-viable sampling methods. Also, some species with very small spores are easily missed, and may be undercounted.

†† Background debris indicates the amount of non-biological particulate matter present on the trace (dust in the air) and the resulting visibility for the analyst. It is rated from 1+ (low) to 4+ (high). Counts from areas with 4+ background debris should be regarded as minimal counts and may be higher than reported. It is important to account for sample volumes when evaluating dust levels.

The analytical sensitivity is the spores/m<sup>3</sup> divided by the raw count, expressed in spores/m<sup>3</sup>. The limit of detection is the analytical sensitivity (in spores/m<sup>3</sup>) multiplied by the sample volume (in liters) divided by 1000 liters.

For more information regarding analytical sensitivity, please contact QA by calling the laboratory.

‡ A "Version" indicated by "-x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

§ Total Spores/m<sup>3</sup> has been rounded to two significant figures to reflect analytical precision.

Client: Hygiene Technologies International, Inc.  
 C/O: Mr. Kenny Hsi, Mr. Lakhpreet Sandhu  
 Re: 21603001-2; 9th Floor Air Sampling

Date of Sampling: 03-18-2016  
 Date of Receipt: 03-18-2016  
 Date of Report: 03-21-2016

**MoldRANGE™: Extended Outdoor Comparison**

**Outdoor Location: 21603001-2TM01OUT**

Fungi Identified	Outdoor data	Typical Outdoor Data for: March in California† (n‡=22640)						Typical Outdoor Data for: The entire year in California† (n‡=230445)					
		very low	low	med	high	very high	freq %	very low	low	med	high	very high	freq %
<b>Generally able to grow indoors*</b>													
Alternaria	67	13	13	27	53	80	45	13	13	27	65	110	53
Bipolaris/Drechslera group	-	7	13	13	27	40	8	7	13	13	27	53	12
Chaetomium	-	7	13	13	27	40	12	8	13	13	27	48	19
Cladosporium	1,400	100	160	430	1,100	1,900	95	110	210	610	1,700	2,800	97
Curvularia	-	7	12	13	27	40	2	7	13	13	27	53	6
Nigrospora	-	7	10	13	13	27	4	7	13	13	27	53	9
Penicillium/Aspergillus types	530	53	53	180	480	750	80	53	100	210	610	1,000	84
Stachybotrys	-	7	13	13	27	56	3	7	13	13	33	67	4
Torula	-	8	13	13	40	67	8	8	13	13	40	67	11
<b>Seldom found growing indoors**</b>													
Ascospores	850	27	53	160	480	860	78	27	53	110	370	750	71
Basidiospores	4,100	67	120	430	1,400	2,800	96	53	80	260	1,000	2,400	93
Oidium	27	13	13	20	53	80	23	13	13	13	50	80	19
Rusts	13	13	13	13	53	80	23	13	13	13	53	87	26
Smuts, Periconia, Myxomycetes	13	13	13	27	67	110	55	13	13	40	110	200	68
<b>§ TOTAL SPORES/m3</b>	<b>7,000</b>												

†The 'Typical Outdoor Data' represents the typical outdoor spore levels for the location and time frame indicated. The last column represents the frequency of occurrence. The very low, low, med, high, and very high values represent the 10, 20, 50, 80, and 90 percentile values of the spore type when it is detected. For example, if the frequency of occurrence is 63% and the low value is 53, it would mean that the given spore type is detected 63% of the time and, when detected, 20% of the time it is present in levels above the detection limit and below 53 spores/m3. These values are updated periodically, and if enough data is not available to make a statistically meaningful assessment, it is indicated with a dash.

§ Total Spores/m3 has been rounded to two significant figures to reflect analytical precision.

\* The spores in this category are generally capable of growing on wet building materials in addition to growing outdoors. Building related growth is dependent upon the fungal type, moisture level, type of material, and other factors. *Cladosporium* is one of the predominant spore types worldwide and is frequently present in high numbers. *Penicillium/Aspergillus* species colonize both outdoor and indoor wet surfaces rapidly and are very easily dispersed. Other genera are usually present in lesser numbers.

\*\* These fungi are generally not found growing on wet building materials. For example, the rusts and smuts are obligate plant pathogens. However, in each group there are notable exceptions. For example, agents of wood decay are members of the basidiomycetes and high counts of a single morphological type of basidiospore on an inside sample should be considered significant.

‡n = number of samples used to calculate data.

Interpretation of the data contained in this report is left to the client or the persons who conducted the field work. This report is provided for informational and comparative purposes only and should not be relied upon for any other purpose. "Typical outdoor data" are based on the results of the analysis of samples delivered to and analyzed by EMLab P&K and assumptions regarding the origins of those samples. Sampling techniques, contaminants infecting samples, unrepresentative samples and other similar or dissimilar factors may affect these results. In addition, EMLab P&K may not have received and tested a representative number of samples for every region or time period. EMLab P&K hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken or omitted in reliance upon, this report.

Client: Hygiene Technologies International, Inc.  
 C/O: Mr. Kenny Hsi, Mr. Lakhpreet Sandhu  
 Re: 21603001-2; 9th Floor Air Sampling

Date of Sampling: 03-18-2016  
 Date of Receipt: 03-18-2016  
 Date of Report: 03-21-2016

**MoldSTAT™: Supplementary Statistical Spore Trap Report**

**Outdoor Summary: 21603001-2TM01OUT:**

Species detected	Outdoor sample spores/m3				Typical outdoor ranges (North America)	Freq. %
	<100	1K	10K	>100K		
Alternaria					7 - 40 - 590	45
Ascospores					13 - 210 - 6,100	76
Basidiospores					13 - 430 - 23,000	92
Cladosporium					27 - 480 - 9,900	90
Oidium					7 - 13 - 210	11
Penicillium/Aspergillus types					13 - 170 - 2,600	67
Rusts					7 - 20 - 360	20
Smuts, Periconia, Myxomycetes					7 - 53 - 930	64
<b>Total</b>						

The "Typical outdoor ranges" and "Freq. %" columns show the typical low, medium, and high spore counts per cubic meter and the frequency of occurrence for the given spore type. The low, medium, and high values represent the 2.5, 50, and 97.5 percentile values when the spore type is detected. For example, if the low value is 53 and the frequency of occurrence is 63%, it would mean that we typically detect the given spore type on 63 percent of all outdoor samples and, when detected, 2.5% of the time it is present in levels below 53 spores/m3.

**Indoor Samples**

**Location: 21603001-2TM02**

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 2%	dF: N/A Result: N/A Critical value: N/A Inside Similar: N/A	Result: 0.4000	dF: 8 Result: 0.7976 Critical value: 0.6190 Outside Similar: Yes	Score: 102 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
	Basidiospores				
	Cladosporium				
	<b>Total</b>				

\* The Friedman chi-square statistic is a non-parametric test that examines variation in a set of data (in this case, all indoor spore counts). The null hypothesis (H0) being tested is that there is no meaningful difference in the data for all indoor locations. The alternative hypothesis (used if the test disproves the null hypothesis) is that there is a difference between the indoor locations. The null hypothesis is rejected when the result of the test is greater than the critical value. The critical value that is displayed is based on the degrees of freedom (dF) of the test and a significance level of 0.05.

\*\* An agreement ratio is a simple method for assessing the similarity of two samples (in this case the indoor sample and the outdoor summary) based on the spore types present. A score of one indicates that the types detected in one location are the same as that in the other. A score of zero indicates that none of the types detected indoors are present outdoors. Typically, an agreement of 0.8 or higher is considered high.

\*\*\* The Spearman rank correlation is a non-parametric test that examines correlation between two sets of data (in this case the indoor location and the outdoor summary). The null hypothesis (H0) being tested is that the indoor and outdoor samples are unrelated. The alternative hypothesis (used if the test disproves the null hypothesis) is that the samples are similar. The null hypothesis is rejected when the result of the test is greater than the critical value. The critical value that is displayed is based on the degrees of freedom (dF) of the test and a significance level of 0.05.

Client: Hygiene Technologies International, Inc.  
C/O: Mr. Kenny Hsi, Mr. Lakhpreet Sandhu  
Re: 21603001-2; 9th Floor Air Sampling

Date of Sampling: 03-18-2016  
Date of Receipt: 03-18-2016  
Date of Report: 03-21-2016

**MoldSTAT™: Supplementary Statistical Spore Trap Report**

\*\*\*\* MoldSCORE™ is a specialized method for examining air sampling data. It is a score between 100 and 300, with 100 indicating a greater likelihood that the airborne indoor spores originated from the outside, and 300 indicating a greater likelihood that they originated from an inside source. The Result displayed is based on the numeric score given and will be either Low, Medium, or High, indicating a low, medium, or high likelihood that the spores detected originated from an indoor source. EMLab P&K reserves the right to, and may at anytime, modify or change the MoldScore algorithm without notice.

Interpretation of the data contained in this report is left to the client or the persons who conducted the field work. This report is provided for informational and comparative purposes only and should not be relied upon for any other purpose. "Typical outdoor ranges" are based on the results of the analysis of samples delivered to and analyzed by EMLab P&K and assumptions regarding the origins of those samples. Sampling techniques, contaminants infecting samples, unrepresentative samples and other similar or dissimilar factors may affect these results. With the statistical analysis provided, as with all statistical comparisons and analyses, false-positive and false-negative results can and do occur. EMLab P&K hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the data contained in, or any actions taken or omitted in reliance upon, this report.

Client: Hygiene Technologies International, Inc.  
 C/O: Mr. Kenny Hsi, Mr. Lakhpreet Sandhu  
 Re: 21603001-2; 9th Floor Air Sampling

Date of Sampling: 03-18-2016  
 Date of Receipt: 03-18-2016  
 Date of Report: 03-21-2016

**MoldSCORE™: Spore Trap Report**

**Outdoor Sample: 21603001-2TM01OUT**

Fungi Identified	Outdoor sample spores/m3				Raw count	Spores/m3
	<100	1K	10K	>100K		
<b>Generally able to grow indoors*</b>						
Alternaria					5	67
Bipolaris/Drechslera group					ND	< 13
Chaetomium					ND	< 13
Cladosporium					26	1,400
Curvularia					ND	< 13
Nigrospora					ND	< 13
Penicillium/Aspergillus types†					10	530
Stachybotrys					ND	< 13
Torula					ND	< 13
<b>Seldom found growing indoors**</b>						
Ascospores					16	850
Basidiospores					77	4,100
Oidium					2	27
Rusts					1	13
Smuts, Periconia, Myxomycetes					1	13
<b>Total</b>						<b>7,000</b>

**Location: 21603001-2TM02**

Fungi Identified	Indoor sample spores/m3				Raw count	Spores/m3
	<100	1K	10K	>100K		
<b>Generally able to grow indoors*</b>						
Alternaria					ND	< 13
Bipolaris/Drechslera group					ND	< 13
Chaetomium					ND	< 13
Cladosporium					1	53
Curvularia					ND	< 13
Nigrospora					ND	< 13
Penicillium/Aspergillus types†					ND	< 13
Stachybotrys					ND	< 13
Torula					ND	< 13
<b>Seldom found growing indoors**</b>						
Ascospores					ND	< 13
Basidiospores					2	110
Rusts					ND	< 13
Smuts, Periconia, Myxomycetes					ND	< 13
<b>Total</b>						<b>160</b>

MoldSCORE‡			
100	200	300	Score
			100
			100
			100
			101
			100
			100
			100
			100
			100
			100
			102
			100
			100
<b>Final MoldSCORE</b>			<b>102</b>

Client: Hygiene Technologies International, Inc.  
C/O: Mr. Kenny Hsi, Mr. Lakhpreet Sandhu  
Re: 21603001-2; 9th Floor Air Sampling

Date of Sampling: 03-18-2016  
Date of Receipt: 03-18-2016  
Date of Report: 03-21-2016

**MoldSCORE™: Spore Trap Report**

\* The spores in this category are generally capable of growing on wet building materials in addition to growing outdoors. Building related growth is dependent upon the fungal type, moisture level, type of material, and other factors. *Cladosporium* is one of the predominant spore types worldwide and is frequently present in high numbers. *Penicillium/Aspergillus* species colonize both outdoor and indoor wet surfaces rapidly and are very easily dispersed. Other genera are usually present in lesser numbers.

\*\* These fungi are generally not found growing on wet building materials. For example, the rusts and smuts are obligate plant pathogens. However, in each group there are notable exceptions. For example, agents of wood decay are members of the basidiomycetes and high counts of a single morphological type of basidiospore on an inside sample should be considered significant.

†The spores of *Aspergillus* and *Penicillium* (and others such as *Acremonium*, *Paecilomyces*) are small and round with very few distinguishing characteristics. They cannot be differentiated by non-viable sampling methods.

‡Rated on a scale from 100 to 300. A rating less than 150 is low and indicates a low probability of spores originating inside. A rating greater than 250 is high and indicates a high probability that the spores originated from inside, presumably from indoor mold growth. A rating between 150 and 250 indicates a moderate likelihood of indoor fungal growth. MoldSCORE is NOT intended for wall cavity samples. It is intended for ambient air samples in residences. Using the analysis on other samples (like wall cavity samples) will lead to misleading results.