December 11, 2015

Clemson University
310 Klugh Avenue
Clemson, South Carolina 29634

Attn: Mr. W. Robert Newberry, IV
E: wnewber@clemson.edu

Re: Limited Mold Investigation Report
Clemson University Textile Lab
500 Lebanon Road
Pendleton, South Carolina 29670
Terracon Project No. 86127158 – Task 51

Dear Mr. Newberry:

Terracon Consultants, Inc. (Terracon) conducted a limited mold investigation Clemson Textile Laboratory located at 500 Lebanon Road in Pendleton, South Carolina. The textile laboratory observed potential fungal growth in a specialty lab at their facility and wanted to confirm air quality (related to mold) and determine the cause of the growth. The sampling was performed in general accordance with our IDC with Clemson University.

## PROJECT DESCRIPTION

### Scope of Services

At the request of Clemson University Terracon conducted a limited mold investigation of the Clemson Textile Laboratory, part of the Clemson Apparel Research group at Clemson University. Terracon representative Mr. Benjamin Hestir performed this investigation on the morning of November 23, 2015. The investigation included a general observation for visible mold, the collection of select surface swabs and air sampling for mold spores. Lab employees Jonn Foulk and Deborah Lickfield were present at the time of the investigation.

### Standard of Care

This investigation was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. Terracon did not attempt to identify every potential exposure or hazard present in the subject building. The results, findings, conclusions, and recommendations expressed in this report are based on conditions observed during our investigation. Many factors, such as weather conditions, building occupancy, ventilation patterns, and seasonal

variations in fungal/bacterial concentrations or local sources of volatile chemicals, can affect the conditions observed. The information contained in this report should not be relied upon to represent conditions that existed prior to or after this investigation. Terracon does not warrant the services of regulatory agencies, laboratories, or other third parties supplying information that may have been used in the preparation of this report.

## INVESTIGATION CRITERIA AND METHODS

### Physical Assessment

The physical assessment was conducted to determine whether building materials were impacted by moisture intrusion or condensate formation, and to identify the presence of visible suspected fungal growth. The investigation focused primarily on collecting observational data (i.e., information obtained by physical assessment of the building and interviews with the building management, owners, and occupants). The physical assessment can help to formulate plans for more in-depth investigation. Destructive sampling or testing to inspect interior wall cavity spaces or mechanical enclosures was not within the scope of work for this project.

The physical assessment included:

- the identification of any discoloration or odor that could indicate moisture intrusion, water damage, and/or fungal growth; and,
- a review of the specifications for an HVAC unit for a specialized lab inside the main structure.

### Mold Sampling

Total non-viable (non-culturable) fungal spore trap samples were collected using Air-O-Cell™ spore trap cassette specifically designed for the collection of airborne mold spores. Air samples were collected using a calibrated Zefon Bio-Pump™ at a flow rate of 15 liters per minute (LPM) for 5 minutes at each location. Additionally surface sampling was conducted using a sterile swab to collect apparent areas of microbial growth and place in a sealed plastic tube.

After air sample collection, the samples were hand delivered to Southeast Environmental Microbiology Laboratories, Inc. (SEEML), accredited by the AIHA® Laboratory Accreditation Programs, LLC under the Environmental Microbiology Laboratory Accreditation Program (EMLAP), Accreditation #173667. The total spore count samples were analyzed by direct microscopic examination and are reported in spores per cubic meter of air (spores/$m^3$). Surface swab samples were cultured by the laboratory using appropriate media and reported in colony forming units per square inch (CFU/$in^2$). The types of fungal growth were reported to the genus level.

There are no state or federal exposure limits established for fungal aerosols. There are currently no regulatory standards or medically based threshold limit or dose-response relationships for exposure to airborne or surface concentrations of mold spores. Terracon relies upon experience, professional judgment, current scientific literature, guidelines and recommendations made by professional organizations and experts, and statistical methods in interpreting mold sampling results.

High variability in airborne fungal spore concentrations can exist in different geographic locations, during different seasons, and weather patterns, and over the course of a given day. As a general rule, indoor air fungal spore concentrations in an HVAC-supplied building are typically less than, but qualitatively similar to, fungal spore concentrations found in the outside environment. In winter months or cooler periods, outdoor mold spore levels may be lower than indoor levels. To help interpret the sampling results, we compared indoor air and outdoor air measurements.

Currently there is no uniform guidance to determine surface fungal growth. To assist in the determination of the surface fungal levels Terracon references the New York Committee for Occupational Safety and Health (NYCOSH) 2014 document *Methods for Evaluation of Indoor Mold Growth.* This guidance document references surface fungal levels of less than 10,000 CFU/in$^2$ as background level.

## Temperature and Relative Humidity

Indoor air temperature and RH are physical conditions important to the perception of comfort. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) has published recommendations regarding thermal comfort. ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy, identifies six primary factors that affect comfort: metabolic rate (affected by the activity being performed); clothing insulation; air temperature; radiant temperature; air speed; and humidity.

Although the relationships are complex, a temperature range between 73 and 79 degrees Fahrenheit (°F) with relative humidity between roughly 20 and 60 percent (%) are recommended for persons performing “office” work and wearing light summer clothing. Higher temperatures require lower humidity for comfort. For persons in winter clothing, temperatures can range between 68 and 75 °F, with relative humidity between 30 and 60%.

EPA recommends maintaining low indoor humidity, below 60% relative humidity, ideally 30-50%, if possible.

Readings of temperature and relative humidity were made with an Extech Model 445580 instrument which was calibrated by the manufacturer.

## FINDINGS

### Physical Assessment

The Clemson Textile Laboratory is located inside an 8,400 square foot slab on grade metal clad building at the Clemson Apparel Research facility in Pendleton, South Carolina. The lab is primarily a large open space with a separate structure inside referred to as a Secure Compartmentalized Information Facility (SCIF) built inside the lab, which has dimensions of 13 feet by 11 feet 4 inches (approximately 147.3 square feet). The SCIF is utilized for specialized research involving the impact of light on the characteristics of textile fibers.

The SCIF has its' own HVAC system, completely separate from the HVAC serving the rest of the structure. The HVAC system dedicated to the SCIF room is a Mitsubishi Model SUZ-KA12NA split-system heat pump. It is rated at 0.75 tons – 1.5 tons of cooling capacity.

At the time of assessment no musty odors were detected in the rooms sampled and no evidence of active water intrusion was observed in the areas sampled. Evidence of fungal growth on a variety of surfaces was observed within the SCIF room. Surficial fungal growth indicates a humidity problem was the likely cause of the fungal growth.

### Mold Air Sampling

On the morning of November 23, 2015, Terracon collected eight (8) non-viable mold spore trap samples; six inside the Clemson Textile Lab facility plus two outdoors for comparison. In addition, surface samples were collected using sterile swabs from two surfaces, a bobbin of thread with visible fungal growth that reportedly occurred inside the SCIF room and from a dust accumulation on a HVAC return air register.

At the time of testing the indoor temperatures ranged from 66º F to 73º F and indoor relative humidity ranged from 21% to 25%. Outdoor temperature was 53º F and outdoor relative humidity was 61% with on a clear day with a slight breeze. The results of the total spore count samples are summarized in Table 1 below:

Table 1: Summary of Total Spore Count Results – November 23, 2015

| Sample # | CLT-1 | CLT-2 | CLT-3 | CLT-4 | CLT-5 | CLT-6 | CLT-9 | CLT-10 |
|---|---|---|---|---|---|---|---|---|
| **Location** | **DL desk** | **South of SCIF bldg.** | **SE quadrant of bldg.** | **SW quadrant of bldg.** | **Right side inside SCIF** | **Sewing table in SCIF** | **Outside 1** | **Outside 2** |
| **Spore Type** | **Spores/ $m^3$** | **Spores/$m^3$** | **Spores/ $m^3$** | **Spores/ $m^3$** | **Spores/ $m^3$** | **Spores/ $m^3$** | **Spores/ $m^3$** | **Spores/ $m^3$** |
| Alternaria | 26 | --- | --- | --- | --- | --- | --- | --- |
| Ascospores | --- | --- | --- | --- | --- | --- | --- | 39 |
| Aspergillus/ Penicillium | --- | --- | --- | 52 | --- | --- | 65 | --- |
| Basidiospores | --- | --- | --- | --- | 26 | --- | 260 | 299 |
| Cladosporium | 13 | 13 | 26 | 65 | 39 | 195 | 195 | 130 |
| Myxomycetes/ Perconia/Smuts | --- | --- | --- | --- | --- | 13 | 52 | 13 |
| **Total** | **39** | **13** | **26** | **117** | **65** | **208** | **572** | **481** |

All six indoor total spore counts were lower than total counts from the outdoor samples. *Basidiospores* and *Cladosporium* were dominant in the two outdoor samples, while *Alternaria* and *Cladosporium* were dominant within the indoor spore counts.

The laboratory analytical report is attached.

Two surface samples were collected using sterile swabs. The first (CTL-7) was collected from the surface of a textile thread bobbin that had reportedly been in the SCIF room and was observed to have apparent fungal growth. The second surface sample (CTL-8) was collected from a dust accumulation on the HVAC return for the main air handler in the building.

CTL-7 was found to contain 3,900 colony forming units per square inch (CFUs/$in^2$) of *Aspergillus versicolor* while CTL-8 was found to contain 2,300 CFUs/$in^2$ of *Cladosporium* and 100 CFUs/$in^2$ of *Penicillium*.

## Conclusions and Recommendations

The following conclusions and recommendations are provided based on our assessment:

- Total spore counts inside were less that those measured in the outdoor air samples and don't appear to indicate fungal amplification inside as of the time of the sampling.
- Temperature readings were within normal comfort levels for an office environment. Relative humidity readings were lower than the recommended 30 – 50% which could cause some degree of discomfort or irritation during the winter months.
- Results of the surface swab samples collected were considered background level in accordance with the NYCOSH guideline. However, it is our understanding this room may

have been previously cleaned which may have biased the sampling results. Also, the swab samples measure viable mold only and the mold from the bobbin of thread had been in a Ziploc style plastic bag for an unknown length of time. Regardless, causes of mold growth of any kind in the indoor environment should be addressed.

- Based on the rated tonnage of the HVAC unit (0.75 – 1.5 tons) serving the SCIF room (less than 150 SF), the fungal issue described in that room may be due to HVAC short cycling, which can result in a cool but damp environment, potentially leading to condensation and resultant fungal growth on widely scattered surfaces within the room. Terracon recommends retaining a HVAC specialist determine the proper heating and cooling requirements for the 150 square foot SCIF room. Ensure the humidity levels are controlled below 60% in order to prevent future surface mold growth from occurring.

- Terracon observed apparent visible mold on the door frame and in spots on the metal filing cabinet. Additional general cleaning of the remaining viable mold (less than two square feet) should be conducted.

Terracon appreciates the opportunity to provide this service to Clemson University. If you have any questions regarding this limited mold investigation report, please contact the undersigned at 864-292-2901.

Sincerely,
**Terracon Consultants, Inc.**



Benjamin Hestir, P.E.
Project Industrial Hygienist



Jeffrey Gurrie
Senior Project Industrial Hygienist

Attachments: Photographs
Laboratory Results

# Photographs



**Photo #1** Location of Sample CTL-1 desk of Deborah Lickfield & CTL-8 (swab) from HVAC return in background



**Photo #2** Sample CTL-1 – temperature and relative humidity



**Photo #3** Location of Sample CTL-2 on spare desk just south of SCIF Room



**Photo #4** Sample CTL-2 – temperature and relative humidity



**Photo #5** Location of Sample CTL-3 – southeast quadrant of building near desk of Jonn Foulk



**Photo #6** Sample CTL-3 – temperature and relative humidity



**Photo #7** Location of Sample CTL-4 – southwest quadrant of building



**Photo #8** Sample CTL-4 – temperature and relative humidity reading



**Photo #9** Location of Sample CTL-5 – inside SCIF room entrance on the right



**Photo #10** Sample CTL-5 – temperature and relative humidity



**Photo #11** Location of Sample CTL-6 – inside SCIF room on the left

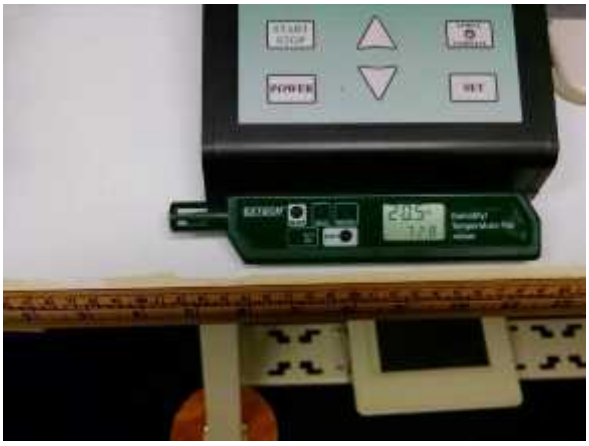


**Photo #12** Sample CTL-6 – temperature and relative humidity



**Photo #13** View of SCIF room within Clemson Textile Laboratory



**Photo #14** View of Mitsubishi HVAC supply/return register in ceiling of SCIF room



**Photo #15** Sample CTL-7 (swab) was taken from the surface of this bobbin




**Photo #16** View of HVAC Model information outside



**Photo #17** Location of Sample CTL-9 – Outside 1 – NE corner exterior



**Photo #18** Location of Sample CTL-10 – Outside 2 in parking lot

# Laboratory Results

SEEML Reference Number:
151124001

**Southeast Environmental Microbiology Laboratories**
506 Laurens Rd
Greenville, SC 29607
Phone: (864) 233-3770
FAX: (864) 233-6589

The information and data for **Terracon** has been checked for thoroughness and accuracy. The following reports are contained within this document:

- ☐ Direct Exam Report
- ☒ Spore Trap Report
- ☐ Quantitative Fungal Report
- ☐ Andersen Fungal Report
- ☐ Quantitative Direct Exam Report

Lab Manager Review: Rafael Berrios Date: 11/24/15

Thank you for using SEEML laboratories. We strive to provide superior quality and service.
SEEML laboratories are AIHA (American Industrial Hygiene Association) Environmental Microbiology Accredited laboratory for only fungal analysis Air-Direct Examination (EMLAP # 173667).

The data within this report is reliable to three significant figures. The third significant figure is technically unjustified. In this instance, the third figure is reported as an estimate to facilitate the interpretation by the customer.

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Guidelines for Interpretation:
No accepted quantitative regulatory standards currently exist by which to assess the health risks related to mold and bacterial exposure. Molds and bacteria have been associated with a variety of health effects and sensitivity varies from person to person.
Several organizations, including: the American Conference of Government Industrial Hygienists (ACGIH); the American Industrial Hygiene Association (AIHA); the Indoor Air Quality Association (IAQA); the United States Environmental Protection Agency (USEPA); the Centers for Disease Control (CDC), as well as the California Department of Health Services (CADHS), have all published guidelines for assessment and interpretation of mold resulting from water intrusion in buildings.

Interpretation of the data and information within this document is left to the company, consultant, and/or persons who conducted the fieldwork.

# Spore Trap Report

| | |
|---|---|
| Attention: Ben Hestir | Date Sampled: 11/23/15 |
| Terracon | Date Received: 11/24/15 |
| 3534 Rutherford Road | Date Analyzed: 11/24/15 |
| Taylors, SC 29687 | Date Reported: 11/24/15 |
| | Date Revised: |
| | Project Name: Clemson Textile Lab |
| | Project Address: 86127158-Task 49 |
| | Project City, State, ZIP: |
| | SEEML Reference # : 151124001 |

**TEST METHOD: DIRECT MICROSCOPY EXAMINATION AT 400X (100% OF TRACE ANALYZED) SEEML SOP 7**

| Client Sample ID | CTL-1 | | | CTL-2 | | | CTL-3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Location | Debra's Desk | | | South Side Of Dark Room | | | Southeast Quadrant of Bldg. | | |
| Lab Sample ID | 151124001-001 | | | 151124001-002 | | | 151124001-003 | | |
| Detection Limit (spores/$m^3$) | 13 | | | 13 | | | 13 | | |
| Hyphal Fragments | 2 | 26 | | 2 | 26 | | | | |
| Pollen | | | | | | | | | |
| Spore Trap Used | AOC | | | AOC | | | AOC | | |
| | raw ct. | spores/$m^3$ | % | raw ct. | spores/$m^3$ | % | raw ct. | spores/$m^3$ | % |
| Alternaria | 2 | 26 | 67 | | | | | | |
| Ascospores | | | | | | | | | |
| Basidiospores | | | | | | | | | |
| Bipolaris/Drechslera | | | | | | | | | |
| Chaetomium | | | | | | | | | |
| Cladosporium | 1 | 13 | 33 | 1 | 13 | 100 | 2 | 26 | 100 |
| Curvularia | | | | | | | | | |
| Epicoccum | | | | | | | | | |
| Cercospora | | | | | | | | | |
| Fusarium | | | | | | | | | |
| Memnoniella | | | | | | | | | |
| Nigrospora | | | | | | | | | |
| Penicillium/Aspergillus | | | | | | | | | |
| Polythrincium | | | | | | | | | |
| Rusts | | | | | | | | | |
| Smuts/Periconia/Myxomy | | | | | | | | | |
| Spegazzinia | | | | | | | | | |
| Stachybotrys | | | | | | | | | |
| Stemphylium | | | | | | | | | |
| Tetraploa | | | | | | | | | |
| Torula | | | | | | | | | |
| Ulocladium | | | | | | | | | |
| Colorless/Other Brown 2 | | | | | | | | | |
| Oidium | | | | | | | | | |
| Zygomycetes | | | | | | | | | |
| Pithomyces | | | | | | | | | |
| Background debris (1-5)3 | 1 | | | 2 | | | 1 | | |
| Sample Volume(liters) | 75 | | | 75 | | | 75 | | |
| **TOTAL SPORES/$M^3$** | 3 | **39** | | 1 | **13** | | 2 | **26** | |

Comments: Condition of the sample(s) upon receipt: Acceptable.

1=Total % may not equal 100 due to rounding.

2 = Colorless,other Brown are spores without a distinctive morphology on spore traps and non-viable surface samples.

3 = Background debris is the amount of particulate matter present on the slide and is graded from 1-5 with 1 = very light, 2= Light, 3 = Medium, 4 = Heavy, 5 = Very Heavy. The higher the rating the more likelihood spores may be underestimated. A rating of 5 should be interpreted as minimal counts and may actually be higher than reported.

The reporting limit is 1 Spore/sample.

Disclaimer: This report relates only to the samples tested

Respectfully submitted, SEEML

*Rafael Berrios*

Rafael Berrios, Approved Laboratory Signatory

506 Laurens Road
Greenville, SC 29607
Phone: (864) 233- 3770
Fax: (864) 233-6589
AIHA-LAP, LLC EMLAP # 173667

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| | SEEML Reference # : 151124001 |

**TEST METHOD: DIRECT MICROSCOPY EXAMINATION AT 400X (100% OF TRACE ANALYZED) SEEML SOP 7**

| Client Sample ID | CTL-4 | | | CTL-5 | | | CTL-6 | | |
|---|---|---|---|---|---|---|---|---|---|
| Location | Southwest Quadrant of Bldg. | | | Right of Entrance-Dark Room | | | On Sewing Table-Dark Room | | |
| Lab Sample ID | 151124001-004 | | | 151124001-005 | | | 151124001-006 | | |
| Detection Limit (spores/$m^3$) | 13 | | | 13 | | | 13 | | |
| Hyphal Fragments | | | | | | | | | |
| Pollen | | | | | | | | | |
| Spore Trap Used | AOC | | | AOC | | | AOC | | |
| | raw ct. | spores/$m^3$ | % | raw ct. | spores/$m^3$ | % | raw ct. | spores/$m^3$ | % |
| Alternaria | | | | | | | | | |
| Ascospores | | | | | | | | | |
| Basidiospores | | | | 2 | 26 | 40 | | | |
| Bipolaris/Drechslera | | | | | | | | | |
| Chaetomium | | | | | | | | | |
| Cladosporium | 5 | 65 | 56 | 3 | 39 | 60 | 15 | 195 | 94 |
| Curvularia | | | | | | | | | |
| Epicoccum | | | | | | | | | |
| Cercospora | | | | | | | | | |
| Fusarium | | | | | | | | | |
| Memnoniella | | | | | | | | | |
| Nigrospora | | | | | | | | | |
| Penicillium/Aspergillus | 4 | 52 | 44 | | | | | | |
| Polythrincium | | | | | | | | | |
| Rusts | | | | | | | | | |
| Smuts/Periconia/Myxomy | | | | | | | 1 | 13 | 6 |
| Spegazzinia | | | | | | | | | |
| Stachybotrys | | | | | | | | | |
| Stemphylium | | | | | | | | | |
| Tetraploa | | | | | | | | | |
| Torula | | | | | | | | | |
| Ulocladium | | | | | | | | | |
| Colorless/Other Brown 2 | | | | | | | | | |
| Oidium | | | | | | | | | |
| Zygomycetes | | | | | | | | | |
| Pithomyces | | | | | | | | | |
| Background debris (1-5)3 | 2 | | | 3 | | | 3 | | |
| Sample Volume(liters) | 75 | | | 75 | | | 75 | | |
| **TOTAL SPORES/$M^3$** | 9 | **117** | | 5 | **65** | | 16 | **208** | |

Comments: Condition of the sample(s) upon receipt: Acceptable.

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| | Project Address: 86127158-Task 49 |
| | Project City, State, ZIP: |
| | SEEML Reference # : 151124001 |

**TEST METHOD: DIRECT MICROSCOPY EXAMINATION AT 400X (100% OF TRACE ANALYZED) SEEML SOP 7**

| Client Sample ID | CTL-9 | | | CTL-10 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Location | Outside-Sidewalk | | | Outside-Parking Lot | | | | | |
| Lab Sample ID | 151124001-009 | | | 151124001-010 | | | | | |
| Detection Limit (spores/$m^3$) | 13 | | | 13 | | | | | |
| Hyphal Fragments | 4 | 52 | | 4 | 52 | | | | |
| Pollen | 1 | 13 | | | | | | | |
| Spore Trap Used | AOC | | | AOC | | | | | |
| | raw ct. | spores/$m^3$ | % | raw ct. | spores/$m^3$ | % | | | |
| Alternaria | | | | | | | | | |
| Ascospores | | | | 3 | 39 | 8 | | | |
| Basidiospores | 20 | 260 | 45 | 23 | 299 | 62 | | | |
| Bipolaris/Drechslera | | | | | | | | | |
| Chaetomium | | | | | | | | | |
| Cladosporium | 15 | 195 | 34 | 10 | 130 | 27 | | | |
| Curvularia | | | | | | | | | |
| Epicoccum | | | | | | | | | |
| Cercospora | | | | | | | | | |
| Fusarium | | | | | | | | | |
| Memnoniella | | | | | | | | | |
| Nigrospora | | | | | | | | | |
| Penicillium/Aspergillus | 5 | 65 | 11 | | | | | | |
| Polythrincium | | | | | | | | | |
| Rusts | | | | | | | | | |
| Smuts/Periconia/Myxomy | 4 | 52 | 9 | 1 | 13 | 3 | | | |
| Spegazzinia | | | | | | | | | |
| Stachybotrys | | | | | | | | | |
| Stemphylium | | | | | | | | | |
| Tetraploa | | | | | | | | | |
| Torula | | | | | | | | | |
| Ulocladium | | | | | | | | | |
| Colorless/Other Brown 2 | | | | | | | | | |
| Oidium | | | | | | | | | |
| Zygomycetes | | | | | | | | | |
| Pithomyces | | | | | | | | | |
| Background debris (1-5)3 | 3 | | | 3 | | | | | |
| Sample Volume(liters) | 75 | | | 75 | | | | | |
| **TOTAL SPORES/$M^3$** | 44 | **572** | | 37 | **481** | | | | |

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SEEML Reference Number:
151124001-QV

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- ☒ Quantitative Fungal Report

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Several organizations, including: the American Conference of Government Industrial Hygienists (ACGIH); the American Industrial Hygiene Association (AIHA); the Indoor Air Quality Association (IAQA); the United States Environmental Protection Agency (USEPA); the Centers for Disease Control (CDC), as well as the California Department of Health Services (CADHS), have all published guidelines for assessment and interpretation of mold resulting from water intrusion in buildings.

Interpretation of the data and information within this document is left to the company, consultant, and/or persons who conducted the fieldwork.

# Quantitative Viable Fungal Report (Swab)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Date Sampled: | | 11/23/2015 | | |
| Attention: Ben Hestir | | | | | Date Received: | | 11/24/2015 | | |
| Terracon | | | | | Date Analyzed: | | 12/1/2015 | | |
| 3534 Rutherford Road | | | | | Date Reported: | | 12/1/2015 | | |
| Taylors, SC 29687 | | | | | Project Name: | | Clemson Textile Lab | | |
| | | | | | Project Address/Number: | | 86127158-Task 49 | | |
| | | | | | Project City, State ZIP: | | | | |
| | | | | | SEEML Reference # : | | 151124001 | | |
| Test method: Viable Swab | | | | | | | | | |
| Client Sample ID | CTL-7 | | | CTL-8 | | | | | |
| Location | Surface of Bobbin | | | Surface of Air Return | | | | | |
| SEEML Sample ID | 151124001-007 | | | 151124001-008 | | | | | |
| Area/sample amount | 1 | | | 1 | | | | | |
| Media Used | MEA | | | MEA | | | | | |
| | raw ct. | cfu**/inch$^2$ | % | raw ct. | cfu**/inch$^2$ | % | raw ct. | cfu**/inch$^2$ | % |
| Alternaria | | | | | | | | | |
| Aspergillus flavus | | | | | | | | | |
| Aspergillus fumigatus | | | | | | | | | |
| Aspergillus glaucus | | | | | | | | | |
| Aspergillus nidulans | | | | | | | | | |
| Aspergillus niger | | | | | | | | | |
| Aspergillus sydowii | | | | | | | | | |
| Aspergillus versicolor | 39 | 3900 | 100 | | | | | | |
| Aspergillus other | | | | | | | | | |
| Aureobasidium | | | | | | | | | |
| Botrytis | | | | | | | | | |
| Chaetomium | | | | | | | | | |
| Cladosporium | | | | 23 | 2300 | 96 | | | |
| Epicoccum | | | | | | | | | |
| Fusarium | | | | | | | | | |
| Mucor | | | | | | | | | |
| Non-sporulating Fungi | | | | | | | | | |
| Paecilomyces | | | | | | | | | |
| Penicillium | | | | 1 | 100 | 4 | | | |
| Phoma | | | | | | | | | |
| Pithomyces | | | | | | | | | |
| Rhizopus | | | | | | | | | |
| Stachybotrys | | | | | | | | | |
| Stemphylium | | | | | | | | | |
| Ulocladium | | | | | | | | | |
| Yeast | | | | | | | | | |
| Dilutions | 1:10$^1$, 1:10$^2$, 1:10$^3$ | | | 1:10$^1$, 1:10$^2$, 1:10$^3$ | | | 1:10$^1$, 1:10$^2$, 1:10$^3$ | | |
| **TOTAL cfu/inch2** | 39 | **3900** | | 24 | **2400** | | | | |

**colony forming units (The reporting limit is 1cfu/sample adjusted for area and dilution factor)

Comments: Condition of the sample(s) upon receipt: Acceptable.

Total % may not equal 100 due to rounding.

Superscripts = 1:10$^1$, 1:10$^2$, 1:10$^3$ are dilution factors. For example a count of 9 on a 1:100 equals 900cfu/inch2

Disclaimer: This report relates only to the samples tested.

Respectfully submitted, SEEML

*Rafael Berrios*

Rafael Berrios, Approved Laboratory Signatory

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# Southeast Environmental Microbiology Laboratories
## Chain of Custody

506-A Laurens Rd, Greenville, SC 29607

Phone : 864-233-3770, Fax: 864-233-3779, www.seeml.com, AIHA-LAP, LLC. (EMLAP) #173667



| For Lab Use Only | | | |
|---|---|---|---|
| Condition of samples is acceptable | ☑ YES ☐ NO | SEEML Ref #: 151124001 | Lab ID: 001 - 010 |

| Company Information | Client Information | | Environmental Conditions | |
|---|---|---|---|---|
| Terracon | Date Sampled: | 11-23-15 | Precipitation in last 16hrs: | No |
| 3534 Rutherford Rd | Project Name: | Clemson Textile Lab | Relative Humidity I/O: | / |
| Taylors, SC 29687 | Project ~~Address~~: | 86127158 - Task 49 | Temperature I/O: | / |
| 864-292-2901 | City, State, Zip: | | Wind Conditions | |
| Ben Hestir | | | | |
| ben.hestir@terracon.com | | | | |

**Sample Type Abbreviations:**

**A**- Allergenco **S**-Swab **AP**-Andersen Plate
**AOC**- Air O Cell **T**-Tape **W**- Water
**M5**- Micro 5 **B**- Bulk **D**- Dust

**Analysis Type:**

1. SporeTrap, Air Sample Analysis-Same Day
2. Direct Exam Surface Sample Analysis -Same Day
3. Culturable Air / Surface Samples -7-10 days

| Sample ID | Sample Location | Sample Type | Analysis Type | *Area | **Volume (L) | Notes |
|---|---|---|---|---|---|---|
| CTL-1 | Debra's Desk | AOC | 1 | | 75 | |
| CTL-2 | South side of "dark" room | " | " | | " | |
| CTL-3 | Southeast quadrant of bldg. | " | " | | " | |
| CTL-4 | South west quadrant of bldg. | " | " | | " | |
| CTL-5 | Right of entrance - "dark" room | " | " | | " | |
| CTL-6 | On sewing table - "dark" room | " | " | | " | |
| CTL-7 | Surface of bobbin | S | 3 | | | |
| CTL-8 | Surface of air return | S | 3 | | | |
| CTL-9 | Outside - sidewalk | AOC | 1 | | 75 | |
| CTL-10 | Outside - parking lot | AOC | 1 | | 75 | |

| Reliquished By: | Date/Time | Recieved By: | Date/Time |
|---|---|---|---|
| Ben Hestir | 11-23-15 1615 | Angel R Jeal | 11-24-15 8:45AM |

* Area is only required for culturable surface samples.

** Volume = Pump setting (L/min) x minutes