

2/26/01

**Report for
Carpet Sampling**

**25 Sigourney Street
Hartford, CT**

Submitted to:

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TABLE OF CONTENTS

Introduction.....	1
Results.....	1
Discussion	2
Conclusion	2
Recommendations	3
Methods	4

Appendices

A. Carpet Sample Results

Attachments

1. Interpretation of Bulk Sample

Introduction

Vacuumed dust samples were taken on January 22nd, 2001 from the 6th and 17th floor carpeting of the building located at 25 Sigourney Street in Hartford, CT. The purpose of the sampling was to determine if carpets located in areas subjected to repeated rainwater exposure had elevated levels of fungal or bacterial growth. Carpeting on the 17th and 19th floors along the perimeter of the building and especially near balconies has been repeatedly exposed to rain water incursion.

Our hypothesis was that carpeting repeatedly exposed to rain water incursion would have higher levels of fungal and bacterial growth than carpeting not repeatedly exposed to rain water. To prove or disprove our hypothesis, we collected a total of eleven vacuum samples of carpet dust with six (6) collected from areas where "no known rain water incursion" occurred and five (5) were collected from areas with "known rain water incursion".

Three (3) of the six (6) vacuum dust samples were taken from the 6th floor carpet and three (3) samples from the 17th floor carpet where there is no known rain water incursion. The other five (5) of the eleven vacuum dust samples were taken from the carpet on the 17th floor where rain water incursion occurred repeatedly. Results from the samples collected in "no known rain water incursion areas" and the results from the "known rain water incursion areas" on 17th floor would be compared with general guidelines we have used to evaluate the need for remedial action.

Results

Sample Numbers 1 through 6 were taken in areas where rain water incursion was not known to occur. Cultureable fungal spore levels ranged from 4,716 to 59,231 colony forming units per gram of dust (CFU/g) with an average of 23,411 CFU/g. We would consider these levels to be representative of moderate fungal growth. Cultureable bacterial spore levels ranged from 18,460 to 197,648 CFU/g with an average of 59,902 CFU/g. We would consider these levels to also be representative of moderate bacterial growth.

Sample Numbers 7 through 11 were taken in areas where rain water incursion was known to occur repeatedly. Cultureable fungal spore levels ranged from 5,833 to 410,000 colony forming units per gram of dust (CFU/g) with an average of 92,913 CFU/g. We would consider these levels to be representative of moderate fungal growth except for one sample (Sample No. 10) which would be considered to have high fungal growth. Cultureable bacterial spore levels ranged from 1,161,667 to 43,981,815 CFU/g with an average of 11,334,668 CFU/g. We would consider these levels to be representative of high bacterial growth. Carpeting that exhibits high fungal or bacterial growth should be removed. The results of the three carpet dust samples are included in Appendix A.

There is no federal or state standard for fungal or bacterial air exposure or building material contaminant levels. We have developed some general guidelines, however, based upon our experience and the experience of other professionals performing microbial investigations. Attachment 1 is a table that provides some general guidelines for interpreting dry bulk or vacuum samples. Attachment 2 is the 6th and 17th floor layout showing the sample locations.

Discussion

Our hypothesis was that carpeted areas repeatedly exposed to rain water incursion would have higher levels of fungal and bacterial growth than carpeting located in an area that was not exposed to rain water. Our results indicated that carpeting from a "no known rain water incursion" area had lower fungal and bacterial growth than the carpet from the area that was repeatedly exposed to rain water.

Cultureable fungal and bacterial spore levels for all six (6) of the samples collected from areas with no known rain water incursion had what we consider moderate growth. Cultureable fungal spore levels in four (4) of the five (5) samples collected in areas with known rain water incursion had moderate fungal growth and the fifth sample had high fungal growth. Cultureable bacterial spore levels in all five (5) of the samples collected in areas with known rain water incursion had what we consider high bacterial growth.

Low levels of bacterial and fungal spores would not require any remediation efforts. Moderate levels of fungal or bacterial spores would require some special cleaning practices such as using high efficiency vacuum cleaners and dry cleaning methods or quick drying wet cleaning. High levels of fungal or bacterial spores would require removal along with protective measures to reduce airborne exposures to building occupants and remediation workers.

Conclusion

Our experience has shown that there is currently no long-term, effective treatment for carpeting that has high fungal or bacterial growth. Since high bacterial spore levels were found in all of the samples collected from areas repeated exposed to rain water incursion, we are recommending removal of carpeting from these areas. Protective measures will be needed to keep airborne spore levels as low as possible during removal of carpets.

Carpeting that had moderate fungal and bacterial spore levels should be cleaned with vacuum cleaners equipped with high efficiency filters. Carpet cleaning using water based methods should be performed following the Institute of Inspection, Cleaning, and Restoration Certification (IICRC) S001 Carpet Cleaning Standard.

Efforts to eliminate rain water incursion should be a priority. Should carpets be exposed to rain water incursion, they should be dried as soon as possible. If carpets are exposed to rain water for more than 48 hours, resulting fungal and or bacterial spores levels will most likely be high.

Recommendations

1. **Provide the results of this report to building occupants.**

It is important that all persons working in areas affected by rain water incursion be kept informed of the work being performed to evaluate and improve the air quality of the

building. Information should include results of any monitoring, remediation efforts, and follow-up procedures. Informational meetings should be held with building occupants and feedback should be encouraged.

2. Eliminate sources of rain water incursion.

Sources of rain water incursion from around the windows or balconies should be identified and eliminated to prevent further wetting of carpets. If carpets are wetted from rain water incursion, they should be dried within 24 hours.

3. Remove carpeting that has been repeatedly wetted from rain water incursion.

Carpeting in areas that have been repeatedly exposed to rain water incursion should be replaced. The practice of removing sections of wetted carpets, drying them, and replacing them in other areas of the building should be stopped.

4. Carpets should be cleaned using vacuum cleaners with high efficiency filters.

Vacuum cleaners with high efficiency filters should be used on carpets with moderate fungal and/or bacterial spore levels. This will reduce the potential for dispersing fungal and bacterial spores and will also help reduce the concentrations of fungal and bacterial levels in the carpets.

5. Carpets should be dried as soon as possible if wet cleaning practices are continued to be used.

Fungal and bacterial growth and amplification is known to occur in carpets that have been wet cleaned with room temperature water and allowed to dry over several days. Wet cleaning, if used, should require hot water of at least 140 °F at the nozzle and the carpets should be completely dried within 24 hours. Carpeting should be cleaned by following the Institute of Inspection, Cleaning, and Restoration Certification (IICRC) S001 Carpet Cleaning Standard (www.iicrc.org).

Methods

The carpet sampling was conducted according to the Occupational Risk Control Services, Inc. Method No. 3. The samples were delivered overnight to an American Industrial Hygiene Association (AIHA) EMPAT accredited laboratory, P&K Microbiology Services, located in Cherry Hill, NJ.

An effort was made to provide a professional evaluation of indoor air quality exposures. It must be noted there are inherent limitations to any survey project. These limitations may be due to time constraints, operational and work practice variability, and seasonal conditions. The results of this survey are representative of conditions present on the day of the survey. Conditions or operations not evaluated, or reported on, should not be assumed to be without risk.

Appendix A

Carpet Dust Vacuum Sample Results

**Tunxis Management
25 Sigourney St.
Hartford, CT.**

January 22, 2001

Sample ID	Location	Fungal / Bacterial ID	Concentration (CFU/g)	Percentage (%)
1	6 th Floor-Zipper Area Outside Room 626	Fungi		
		Exophiala yeasts	2,985	33
			5,970	67
			Total 8,955	
		Bacteria		
		Bacillus	11,940	44
		Flavobacterium	2,985	11
		gram negative bacteria	5,970	22
		Micrococcus luteus	2,985	11
		Pseudomonas sp. non aeruginosa	2,985	11
		Total 26,865		
2	6 th Floor-Zone 7 Between Steve Sullivan/Robert Sadlowski Cubicles	Fungi		
		Chaetomium globosum	769	1
		Cladosporium	769	1
		Exophiala	769	1
		Fusarium	769	1
		yeasts	56,231	95
			Total 59,231	
		Bacteria		
		Actinomycetes	769	4
		Bacillus	6,923	38
		Flavobacterium	1,538	8
		gram negative bacteria and others	4,615	25
		Micrococcus luteus	3,846	21
Pseudomonas sp. non aeruginosa	769	4		
		Total 18,460		

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Sample ID	Location	Fungal / Bacterial ID	Concentration (CFU/g)	Percentage (%)
3	6 th Floor-Zone 6 Outside Calvin Mellor's Office	Fungi		
		Epicoccum nigrum	943	20
		Mucor	2,830	60
		sterile fungi	943	20
			Total 4,716	
		Bacteria		
		Actinomycetes	943	4
		Bacillus	8,491	39
		Gram negative bacteria	2,830	13
		Methylobacterium	943	4
		Micrococcus luteus	2,830	13
		Staphylococcus	5,660	26
			Total 21,697	
4	17 th Floor-Zipper Area Between Benedict Gedraitis/ Matt Douglas Cubicles	Fungi		
		Alternaria alternata	2,353	14
		Aureobasidium pullulans	2,353	14
		Exophiala	4,706	29
		Oidiodendron cereale	4,706	29
		Rhodotorula glutinis	2,353	14
			Total 16,471	
		Bacteria		
		Bacillus	35,294	18
		Flavobacterium	4,706	2
		gram negative bacteria and others	49,412	25
		Micrococcus luteus	11,765	6
		Pseudomonas sp. non aeruginosa	14,118	7
Stenotrophomonas maltophilia	82,353	42		
	Total 197,648			

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Sample ID	Location	Fungal / Bacterial ID	Concentration (CFU/g)	Percentage (%)	
5	17 th Floor-Zone 6 Between Maurice Brochu/Lynda Cianciolo Cubicles	Fungi			
		Aureobasidium pullulans	597	8	
		Cladosporium	1,791	23	
		Exophiala	597	8	
		Nigrospora sphaerica	597	8	
		Penicillium	597	8	
		Pithomyces chartarum	597	8	
		Rhodotorula glutinis	597	8	
		sterile fungi	597	8	
		yeasts	1,791	23	
		Bacteria			
		Bacillus	14,328	71	
		gram negative bacteria and others	3,582	18	
		Micrococcus luteus	2,388	12	
Total	20,298				
6	17 th Floor-Zone 1 Between David Bussa Cubicle and Main Column	Fungi			
		Epicoccum nigrum	3,333	8	
		Phoma	18,889	44	
		Rhodotorula glutinis	5,556	13	
		yeasts	15,556	36	
		Total	43,334		
		Bacteria			
		Bacillus	3,333	4	
		Flavobacterium	2,222	3	
		gram negative bacteria and others	23,333	31	
		Methylobacterium	5,556	7	
		Micrococcus luteus	4,444	6	
		Pseudomonas sp. Non aeruginosa	2,222	3	
		Rhodococcus	1,111	1	
Staphylococcus	23,333	31			
Stenotrophomonas maltophilia	8,889	12			
Total	74,443				

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Sample ID	Location	Fungal / Bacterial ID	Concentration (CFU/g)	Percentage (%)	
7	17 th Floor-Zone 4 Under Desk of Edward Oldakowski	Fungi			
		Acremonium	1,379	6	
		Alternaria alternata	2,759	13	
		Cladosporium	5,517	25	
		Epicoccum nigrum	2,759	13	
		Gliocladium roseum	4,138	19	
		Penicillium	1,379	6	
		Phoma	1,379	6	
		Pithomyces chartarum	1,379	6	
		Stachybotrys chartarum	1,379	6	
		Total 22,068			
		Bacteria			
		Bacillus	113,103	2	
		Flavobacterium	113,103	2	
		gram negative bacteria and others	735,172	16	
		Methylobacterium	169,655	4	
		Micrococcus luteus	113,103	2	
		Pseudomonas sp. non aeruginosa	2,148,966	46	
		Rhodococcus	282,759	6	
		Shewanella putrefaciens	622,069	13	
Staphylococcus	395,862	8			
Total 4,693,792					
8	17 th Floor-Zone 5 Conference Room 1713	Fungi			
		Rhodotorula glutinis	833	14	
		yeasts	5,000	86	
		Total 5,833			
		Bacteria			
		Bacillus	273,333	24	
		gram negative bacteria and others	239,167	21	
Pseudomonas sp. non aeruginosa	239,167	21			
Shewanella putrefaciens	410,000	35			
Total 1,161,667					

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Sample ID	Location	Fungal / Bacterial ID	Concentration (CFU/g)	Percentage (%)	
9	17 th Floor-Zone 5 Raymond Ostasiewski Office	Fungi			
		Cladosporium	1,333	20	
		Curvularia lunata	1,333	20	
		Exophiala	1,333	20	
		sterile fungi	1,333	20	
		yeasts	1,333	20	
		Total 6,665			
		Bacteria			
		Bacillus	43,733	2	
		Flavobacterium	896,533	34	
		gram negative bacteria and others	349,867	13	
		Rhodococcus	699,733	26	
Shewanella putrefaciens	677,867	25			
Total 2,667,733					
10	17 th Floor-Zone 7 Victor Szwez Office	Fungi			
		Sterile fungi	37,273	9	
		Ulocladium botrytis	223,636	55	
		yeasts	149,091	36	
		Total 410,000			
		Bacteria			
		Flavobacterium	4,100,000	9	
		gram negative bacteria and others	8,945,455	20	
		Methylobacterium	10,436,360	24	
		Micrococcus luteus	4,100,000	9	
		Pseudomonas sp. non aeruginosa	5,218,182	12	
		Rhodococcus	2,981,818	7	
Shewanella putrefaciens	8,200,000	19			
Total 43,981,815					

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Sample ID	Location	Fungal / Bacterial ID	Concentration (CFU/g)	Percentage (%)	
11	17 th Floor-Zone 7 Michael Romeo Office	Fungi			
		Penicillium	6,667	33	
		Phoma	1,667	8	
		Rhodotorula glutinis	1,667	8	
		sterile fungi	1,667	8	
		yeasts	8,333	42	
		Total 20,001			
		Bacteria			
		gram negative bacteria and others	546,667	13	
		Pseudomonas sp. non aeruginosa	888,333	21	
Shewanella putrefaciens	2,733,333	66			
Total 4,168,333					

CFU/g - Colony Forming Units per Gram