

Scientific Air Solutions



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September 15, 2020

Pre and In-treatment Air and Surface Report – [REDACTED], [REDACTED], [REDACTED]

A. Summary – Air Samples

Pre and In-treatment air samples results given below.

Sample Date	Treatment	Number of samples	Location	Average (cfu/m ³)	Range	Standard Deviation	% Reduction
07/16/2020	Pre	15	Various	356	200/533	83.2	-
09/08/2020	In			96	0/133	34.1	73.0
07/16/2020	Pre	4	Exterior	2,175	2,033/2,333	116.4	-
09/08/2020	In			2,258	2,200/2,300	43.3	+ 3.7

Background

All air samples were taken via the MB-1 volumetric air sampler, 30 liters per samples from the various locations given above with results normalized to colony forming units per cubic meter of air (cfu/m³).

Given below are airborne organisms found in the above locations for this **pre-treatment** sampling, excluding the outside samples.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	1,008	<i>Penicillium brevicompactum</i>	630
<i>Aspergillus fumigatus</i>	945	<i>Absidia spp</i>	530
<i>Penicillium purpurogenum</i>	820	<i>Firmicutes spp</i>	405
<i>Cladosporium sphaerospermum</i>	776	<i>Ulocladium chartarum</i>	220

Noted below are airborne organisms from the above locations for this **in-treatment** sampling, excluding the outside samples.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	440	<i>Penicillium brevicompactum</i>	90
<i>Aspergillus fumigatus</i>	345	<i>Absidia spp</i>	85
<i>Penicillium purpurogenum</i>	205	<i>Firmicutes spp</i>	75
<i>Cladosporium sphaerospermum</i>	130	<i>Ulocladium chartarum</i>	63

07/16/2020 - Pre-treatment bioburden in the above locations are somewhat > 300 cfu/m³ which is not acceptable and needs corrective action.

09/08/2020 - In-treatment results show a **73% decrease** from the pre-treatment samples, these results are now < 100 cfu/m³ and are considered **clean and acceptable**.

Observations

The exterior air samples ranged from **2,033 to 2,333 cfu/m³** and reveals that most of the bioburden is attributed to the outside air. The airPHX unit is having an impact on reducing the bioburden.



Target Air Quality

Air quality scale for workplaces, public buildings, schools, and homes are as follows:

- $< 100 \text{ cfu/m}^3$ is considered **clean and acceptable**.
- 100 to 300 cfu/m^3 is **marginal**.
- $> 300 \text{ cfu/m}^3$ is **not acceptable** and needs corrective action.

In most cases, air quality $< 100 \text{ cfu/m}^3$ has shown a decrease in the overall bioburden and odors.

Predominant Microorganisms

Although the predominant organisms noted in this report are fungi, previous testing results show bacteria, viruses and protozoa are eliminated as effectively as fungi. The oxidative molecules generated are effective on gram +, gram – bacteria, protozoa, spores and viruses.

B. Summary – Surface Contact Swabs

Pre and In-treatment surface (swab) samples results given below.

Sample Date	Treatment	Number of samples	Location	Average (cfu/cm ²)	Range	Standard Deviation	% Reduction
07/16/2020	Pre	6	Various	27.0	12/48	11.1	-
09/08/2020	In			4.1	1.8/7.2	1.7	84.8
07/16/2020	Pre	1	Negative Control	0	0/0	-	-
09/08/2020	In			0	0/0	-	-

07/16/2020 - Pre-treatment contact swab results from the various locations are $> 10 \text{ cfu/cm}^2$ which is considered not acceptable and needs corrective action.

09/08/2020 - In-treatment contact swab results show a **84.8% reduction** from the pre-treatment samples from the same locations which are now $< 5 \text{ cfu/cm}^2$ which is considered **clean and acceptable**. A Further reduction can be expected with continued treatment.

Target Contact Surface Quality

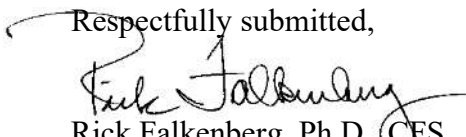
Contact surface quality scale for workplaces, public buildings, schools, and homes are as follows:

- $< 5 \text{ cfu/cm}^2$ is considered **clean and acceptable**.
- 5 to 10 cfu/cm^2 is considered **marginal**.
- $> 10 \text{ cfu/cm}^2$ is considered **not acceptable** and needs corrective action.

In most cases, surface swabs $< 5 \text{ cfu/cm}^2$ has shown a decrease in the overall bioburden and odors.

Please contact me if there are questions or if further information is needed.

Respectfully submitted,


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Senior Principal Scientist

Scientific Air Solutions



Table #1

09/08/2020 In-treatment Air Sample Results - CFU/m³

09/08/2020 - In-treatment						
Plate Lot No.	Air Sample Location	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m ³
745	Ctrl	Unopened	0	0	0	0
744	1		30	3	3	100
747	2		30	3	3	100
746	3		30	2	2	67
749	4		30	4	4	133
748	5		30	4	4	133
751	6		30	3	3	100
759	7		30	0	0	0
753	8		30	4	4	133
752	9		30	3	3	100
1105	10		30	2	2	67
1104	11		30	3	3	100
1107	12		30	2	2	67
1106	13		30	3	3	100
1108	14		30	4	4	133
7120	15		30	3	3	100
Avg 96 High 133						
Low 0 SD 34.1						
7140	1	Exterior	30	59	69	2,300
7132	2	Exterior	30	57	66	2,200
7128	3	Exterior	30	58	67	2,233
7124	4	Exterior	30	59	69	2,300
Avg 2,258 High 2,300						
Low 2,200 SD 43.3						

Total Adjusted Raw Count 31

Total CFU/m³ 1,433

Table #1, continued

07/16/2020 Pre-treatment Air Sample Results - CFU/m³

07/16/2020 - Pre-treatment						
Plate Lot No.	Air Sample Location	Air Sample Location	Liters of Air	Raw Count	Corrected Count	CFU/m ³
1110	Ctrl	Unopened	0	0	0	0
1111	1		30	11	11	367
1112	2		30	9	9	300
1113	3		30	12	12	400
7141	4		30	10	10	333
7145	5		30	15	16	533
7133	6		30	13	13	433
7137	7		30	6	6	200
7129	8		30	12	12	400
7125	9		30	14	14	467
7121	10		30	12	12	400
7117	11		30	10	10	333
7113	12		30	8	8	267
7109	13		30	10	10	333
7144	14		30	8	8	267
7136	15		30	9	9	300
Avg 356 High 533						
Low 200 SD 83.2						
7116	1	Exterior	30	53	61	2,033
7112	2	Exterior	30	55	63	2,100
7108	3	Exterior	30	60	70	2,333
1109	4	Exterior	30	58	67	2,233
Avg 2,175 High 2,333						
Low 2,033 SD 116.4						

Total Adjusted Raw Count 125

Total CFU/m³ 5,333



Table #2

09/08/2020 In-treatment Surface Sample Results – CFU/cm²

09/08/2020 - In-treatment, [REDACTED]					
Room	Swab Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm ²
N/A	CTRL	Swab not removed from container	0	0	0
Surface	1	Check-in desk	10x10x10	720	7.2
Surface	2	Door handle staff lounge	10x10x10	420	4.2
Surface	3	Counter between sinks	10x10x10	315	3.2
Surface	4	Back of blue chair	10x10x10	180	1.8
Surface	5	Door handle center	10x10x10	470	4.7
Surface	6	Crach bar right door	10x10x10	330	3.3

Avg 4.1 Max 7.2
Min 1.8 SD 1.67

Total Adjusted Raw Count 2,435
Total CFU/cm² 24

Table #2, continued

07/16/2020 Pre-treatment Surface Sample Results – CFU/cm²

07/16/2020 - Pre-treatment, [REDACTED]					
Room	Swab Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm ²
N/A	CTRL	Swab not removed from container	0	0	0
Surface	1	Check-in desk	10x10x10	4,800	48.0
Surface	2	Door handle staff lounge	10x10x10	2,800	28.0
Surface	3	Counter between sinks	10x10x10	2,100	21.0
Surface	4	Back of blue chair	10x10x10	1,200	12.0
Surface	5	Door handle center	10x10x10	3,100	31.0
Surface	6	Crach bar right door	10x10x10	2,200	22.0

Avg 27.0 Max 48.0
Min 12.0 SD 11.14

Total Adjusted Raw Count 16,200
Total CFU/cm² 162



Table #3

09/08/2020 In-treatment Air Sample Pictures

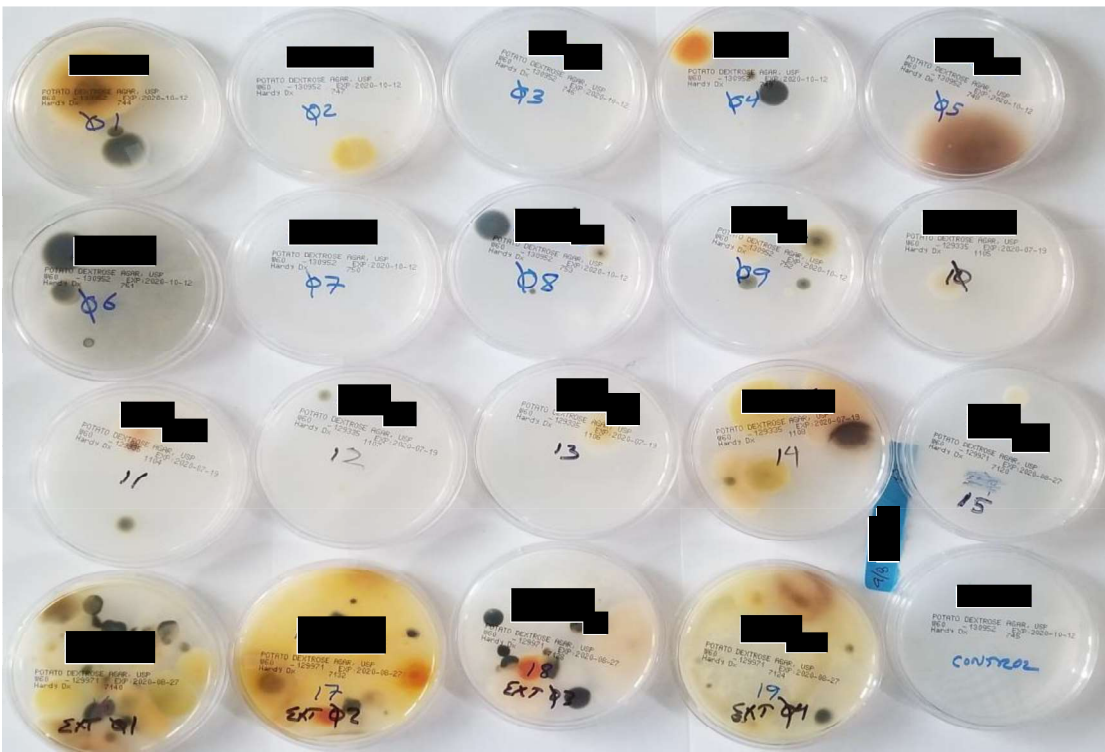
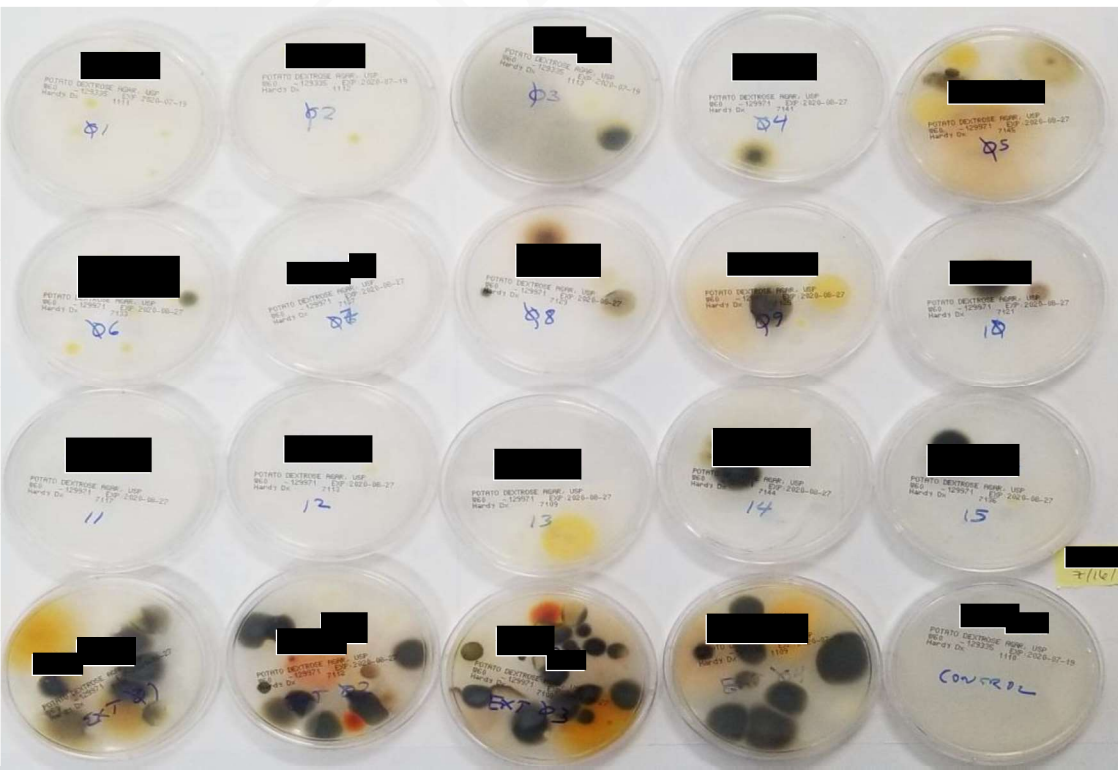


Table #3, continued

07/16/2020 Pre-treatment Air Sample Pictures



[illegible]