



3301 N.W. 55TH ST., FT. LAUDERDALE, FL 33309  
(888) 854-0477

PREPARED FOR: HALLIGAN HOME INSPECTION SERVICES LLC

TEST ADDRESS: [REDACTED] FORT DODGE, IA 50501

# CERTIFICATE OF MOLD ANALYSIS

## PREPARED FOR:

HALLIGAN HOME INSPECTION SERVICES LLC

PHONE NUMBER: (515) 576-5327

EMAIL: DON@HALLIGANHOMEINSPECTIONS.COM

## TEST LOCATION:

[REDACTED]

[REDACTED]

**FORT DODGE, IA 50501**

**CHAIN OF CUSTODY # 52233256**

COLLECTED: WED DECEMBER 05, 2018

RECEIVED: MON DECEMBER 10, 2018

REPORTED: MON DECEMBER 10, 2018

**APPROVED BY: JOHN D. SHANE PH.D.,  
LABORATORY MANAGER**

VERSION: 1.0 (A VERSION NUMBER GREATER THAN ONE (1) INDICATES THAT THE DATA IN THIS REPORT HAS BEEN AMENDED)

EPA regulations or standards for airborne or surface mold concentrations have not been established. There are also no EPA regulations or standards for evaluating health effects due to mold exposure. Information about mold can be found at [www.epa.gov/mold](http://www.epa.gov/mold).

All samples were received in an acceptable condition for analysis unless noted specifically in the Comments section under a particular sample. All results relate only to the samples submitted for analysis.

A version greater than 1.0 indicates that the lab report has been revised.

FOR MORE INFORMATION, PLEASE CONTACT INSPECTORLAB AT (888) 854-0477 OR EMAIL [ASK@INSPECTORLAB.COM](mailto:ASK@INSPECTORLAB.COM)

## Detailed Mold Report (WATER-INDICATING FUNGI ARE SHOWN BELOW IN RED)

Analysis Method	Air Analysis	Air Analysis	Air Analysis	Air Analysis
Lab Sample #	52233256-1	52233256-2	52233256-3	52233256-4
Sample Identification	27020373	27020395	27020352	27020726
Sample Location	OUTDOORS WINDWARD SIDE	OUTDOORS LEEWARD SIDE	BASEMENT	MAIN FLOOR LIVING ROOM
Sample Type / Metric	Air-O-Cell/150.0L	Air-O-Cell/150.0L	Air-O-Cell/150.0L	Air-O-Cell/150.0L
Analysis Date	Mon December 10, 2018	Mon December 10, 2018	Mon December 10, 2018	Mon December 10, 2018
<b>Determination</b>	<b>CONTROL</b>	<b>CONTROL</b>	<b>PROBLEM</b>	<b>PROBLEM</b>

Fungal Types Identified	Raw Count	Spores / m <sup>3</sup>	% of Total	Raw Count	Spores / m <sup>3</sup>	% of Total	Raw Count	Spores / m <sup>3</sup>	% of Total	Raw Count	Spores / m <sup>3</sup>	% of Total
<b>*INDOOR PROBLEM FUNGI</b>												
<b>Penicillium/Aspergillus</b>	---	---	---	---	---	---	37,565	251,686	99	3,755	25,159	99
<b>**Non-Problem Fungi</b>												
Alternaria	---	---	---	---	---	---	1	7	<1	---	---	---
Cladosporium	1	7	25	3	20	6	---	---	---	---	---	---
Curvularia	---	---	---	1	7	2	---	---	---	---	---	---
Epicoccum	---	---	---	1	7	2	3	20	<1	---	---	---
Nigrospora	1	7	25	---	---	---	---	---	---	---	---	---
Penicillium/Aspergillus	2	13	48	38	255	84	*	*	*	*	*	*
Pithomyces	---	---	---	---	---	---	1	7	<1	---	---	---
Smut/Myxomycetes	---	---	---	2	13	4	2	13	<1	1	7	<1
<b>Total Spore Count</b>	4	27	100	45	302	100	37,572	251,733	100	3,756	25,166	100
<b>Minimum Detection Limit</b>	7			7			7			7		
<b>Comments/Definitions</b> <b>Raw Count:</b> Actual number of spores observed and counted. <b>Spores/m<sup>3</sup>:</b> Spores per cubic meter. <b>% of Total:</b> Percentage of a particular spore in relation to total number of spores. <b>X:</b> Spore type was observed. <b>---</b> : Spore type was not observed.	CONTROL samples are normally taken outside a building to provide a baseline from which samples on the interior of the building are compared. Outside air is considered normal whatever the mold counts may be. LIGHT DEBRIS: The debris present in the sample likely had no effect on the accuracy of the mold count.			CONTROL samples are normally taken outside a building to provide a baseline from which samples on the interior of the building are compared. Outside air is considered normal whatever the mold counts may be. LIGHT DEBRIS: The debris present in the sample likely had no effect on the accuracy of the mold count.			THE SPORES ARE TOO NUMEROUS TO COUNT ACCURATELY AND THE SPORE COUNTS ARE ESTIMATED. Mold concentrations in the air are ABNORMAL and based on the mold counts, you likely have a mold source from which spores are able to become airborne and are an exposure risk to the occupants. The high number of fungal spores present in the sample caused significant interference that has affected the accuracy of the mold count. It is likely that the mold counts are significantly higher than is reported in this sample.			Mold concentrations in the air are ABNORMAL and based on the mold counts, you likely have a mold source from which spores are able to become airborne and are an exposure concern to the occupants. LIGHT DEBRIS: The debris present in the sample likely had no effect on the accuracy of the mold count.		

\* **Indoor Problem Fungi** are generally capable of growing on wetted building materials.

\*\* **Non-Problem Fungi** are less capable or do not grow on wetted building materials. They are commonly found in the air outside and infiltrate into indoor air naturally. High numbers of any one of these spore types as compared to the Control sample may indicate that they are growing on wetted building materials indoors.

**Spore types not listed in this report were not observed.**

**Background debris** estimates the amount of non-spore particles. Increasing amount of debris will affect the accuracy of the spore counts. Total percent may not equal 100% due to rounding.

# Detailed Mold Report

(WATER-INDICATING FUNGI ARE SHOWN BELOW IN RED)

Analysis Method	Surface Analysis	Surface Analysis	Intentionally Blank	Intentionally Blank
Lab Sample #	52233256-6	52233256-8		
Sample Identification	SLIDE #6	SLIDE #8		
Sample Location	BEDROOM WINDOW SILL	UNDER SIDE OF ROOF SHEATHING		
Sample Type / Metric	Bio-Tape	Bio-Tape		
Analysis Date	Mon December 10, 2018	Mon December 10, 2018		
<b>Determination</b>	<b>GROWTH</b>	<b>GROWTH</b>		

Fungal Types Identified	Mold Present	Mold Present		
<b>Cladosporium</b>	X	X		
<b>Hyphae</b>	X	X		
<b>Penicillium/Aspergillus</b>	X	---		
<b>Ulocladium</b>	X	---		
<b>Total Spore Count</b>	X	X		
<b>Minimum Detection Limit</b>	N/A	N/A		
<b>Comments/Definitions</b> <b>Raw Count:</b> Actual number of spores observed and counted. <b>Spores/m<sup>3</sup>:</b> Spores per cubic meter. <b>% of Total:</b> Percentage of a particular spore in relation to total number of spores. <b>X:</b> Spore type was observed. <b>---</b> : Spore type was not observed.	Presence of current or former MOLD GROWTH observed. EXPOSURE TO SPORES LIKELY and will continue if the growth is not removed. An active or intermittent water source will cause the mold to continue to grow if the water source is not eliminated.	Presence of current or former MOLD GROWTH observed. EXPOSURE TO SPORES LIKELY and will continue if the growth is not removed. An active or intermittent water source will cause the mold to continue to grow if the water source is not eliminated.	INTENTIONALLY BLANK	INTENTIONALLY BLANK

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**Introduction**

All spores found in indoor air are also normally found in outdoor air because most originate or live in the soil and on dead or decaying plants. Therefore, it is not unusual to find mold spores in indoor air. This Mold Glossary is only intended to provide general information about the mold found in the samples that were provided to the laboratory.

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***Alternaria***

**Outdoor Habitat:** One of the most commonly observed spores in the outdoor air worldwide, normally in low numbers.

**Indoor Habitat:** Capable of growing on a wide variety of substrates and manufactured products found indoors when wetted.

**Allergy Potential:** Type I (hay fever, asthma), Type III (hypersensitivity pneumonitis), Common cause of extrinsic asthma

**Disease Potential:** Not normally considered a pathogen, but can become so in immunocompromised persons.

**Toxin Potential:** Several known

**Comments:** One of the most common and potent allergens in the indoor and outdoor air. Seen in indoor air in low concentrations, probably as a result of outdoor air infiltration and/or recycling of settled dust.

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***Cladosporium***

**Outdoor Habitat:** Cladosporium is one of the most common environmental fungi observed worldwide and is widely reported from soil and decaying vegetation.

Cladosporium herbarum and C. cladosporioides are among the most frequently encountered species, both in outdoor and indoor environments.

**Indoor Habitat:** Wetted wood and gypsum wallboard paper, paper products, textiles, rubber, window sills. Cladosporium has the ability to grow at low temperatures and can thus, grow on rubber gaskets and food in refrigerators.

**Allergy Potential:** Type I (hay fever, asthma) - an important and common outdoor allergen

**Disease Potential:** Opportunistic pathogen in immunocompromised persons, not normally a pathogen in healthy individuals. Cladosporium are some of the most common species reported as indoor contaminants, occasionally linked to health problems.

**Toxin Potential:** Cladosporium has two known toxins (cladosporin and emodin). These toxins are not known to be highly toxic. There is no evidence in the literature of toxic effects associated to inhalation of Cladosporium conidia (spores) indoors.

**Comments:** The most commonly reported spore in the outdoor air worldwide. This makes Cladosporium one of the most commonly reported and abundant spore types both indoors and outdoors. The prevalence of this spore can vary throughout the year, but is especially high in late summer and autumn, especially where cereal crops are commonly planted.

An important and common allergen source.

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***Curvularia***

**Outdoor Habitat:** Soil and decaying vegetation

**Indoor Habitat:** Wetted wood and gypsum wallboard paper, many cellulytic substrates

**Allergy Potential:** Type I (hay fever, asthma), common cause of allergenic rhinitis

**Disease Potential:** Potential human pathogen in immunocompromised people

**Toxin Potential:** None known

**Comments:** None

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***Epicoccum***

**Outdoor Habitat:** Epicoccum is a widespread cosmopolitan that grows on dead or decaying organic matter, wood, textiles, paper, a variety of foods, insects and human skin. It is commonly found in the soil. Epicoccum spores are more prevalent on dry, windy days, with higher counts late in the day.

**Indoor Habitat:** Capable of growing on a wide variety of substrates and manufactured products found indoors when wetted such as gypsum board, floors, carpets, mattress dust, and house plants.

**Allergy Potential:** Type I (hay fever, asthma)

**Disease Potential:** None known

**Toxin Potential:** None known

**Comments:** Very common in outdoor air in the summer months, especially in the midwest USA during harvest times.

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***Hyphae***

**Outdoor Habitat:** Soil and decaying vegetation

**Indoor Habitat:** Wetted wood and gypsum wallboard paper

**Allergy Potential:** Known to be allergenic.

**Disease Potential:** None known

**Toxin Potential:** None known

**Comments:** "Root-like" structures of fungal growth that can become airborne and may be allergenic.

When hyphae are found growing on a surface and associated with fruiting bodies and/or fungal spores, they indicate that growth has taken place and remedial action is suggested. Sometimes hyphae grow and do not produce spores. A hyphal mass is indicative of mold growth.

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***Nigrospora***

**Outdoor Habitat:** Soil and decaying vegetation

**Indoor Habitat:** Wetted wood and gypsum wallboard paper

**Allergy Potential:** Type I (hay fever, asthma)

**Disease Potential:** None known

**Toxin Potential:** None known

**Comments:** Rarely observed growing indoors

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***Penicillium/Aspergillus***

**Outdoor Habitat:** Soil and decaying vegetation, textiles, fruits. These spores are commonly observed and are a normal part of outside air.

**Indoor Habitat:** Wetted wood and gypsum wallboard paper, textiles, leather, able to grow on many types of substrates.

**Allergy Potential:** Type I (hay fever, asthma), Type III (hypersensitivity pneumonitis)

**Disease Potential:** Opportunistic pathogen in immunocompromised persons, not normally a pathogen in healthy individuals.

**Toxin Potential:** Several known

**Comments:** Extremely common in indoor air in low amounts. This type of spore should not constitute an overwhelming percentage and be present in very high numbers.

These two genera are grouped together because they cannot be reliably differentiated into their respective genera based solely on spore morphology.

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***Pithomyces***

**Outdoor Habitat:** Soil and decaying vegetation and their spores are easily dispersed into the air by wind

**Indoor Habitat:** Wetted wood and gypsum wallboard paper

**Allergy Potential:** None known

**Disease Potential:** None known

**Toxin Potential:** One known (sporidesmin)

**Comments:** A very common spore type in the air. Can be a water indicator mold type indoors

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***Smut/Myxomycetes***

**Outdoor Habitat:** Soil and decaying vegetation and wood, especially dead stumps and bark

**Indoor Habitat:** Not known to grow indoors, sometimes found on firewood

**Allergy Potential:** Type I (hay fever, asthma), rare

**Disease Potential:** None known

**Toxin Potential:** None known

**Comments:** These two groups are difficult to distinguish due to their "round, brown" morphology. Smuts are especially common in the environment and can be seen in indoor air samples even during the winter in homes because the spores can get trapped in carpets

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### *Ulocladium*

**Outdoor Habitat:** A filamentous fungus that inhabits the soil and decaying herbaceous plants.

**Indoor Habitat:** Chronically wetted wood, gypsum wallboard paper, textiles, paint. Can be found in the air from disturbed growth and/or distributed in dust. Considered a contaminant indoors.

**Allergy Potential:** Type I (hay fever, asthma)  
Anecdotal evidence suggests that *Ulocladium chartarum* induces symptoms of asthma, allergic rhinitis and hypersensitivity pneumonitis in sensitized individuals. It is possible that allergic reactions occur more frequently than has been reported.

**Disease Potential:** *Ulocladium* is rarely pathogenic for humans. A few cases of opportunistic infections have been reported although this mold is known to be allergenic. *Ulocladium* sp. is of low pathogenicity, and is very seldom reported as a human pathogen may result in opportunistic infections such as in chronic wounds.

**Toxin Potential:** There are no reported mycotoxins produced by *Ulocladium* that would be deleterious to humans or animals.

**Comments:** High water requirement mold type and is not often seen in indoor air samples unless growth is dried and disturbed. However, no studies have been reported to date;

*Ulocladium* species closely resemble certain species of *Alternaria* and have sometimes been classified as such in the past. In fact, *Ulocladium* spp. are phylogenetically related to *Alternaria* spp.

*Ulocladium* can be present on building materials but not in the air, possibly indicating that spores from certain types may not be easily released into the air.