



EMSL Analytical, Inc.

200 Route 130 North, NJ 08077 Tel: 856-858-4800

Client: Company Name
Company Address
City, ST Zip

Attention: Company Contact

Project: Sample Report

EMSL Order ID: 000000000

Date Received: 1/26/2021

Date Analyzed: 2/3/2021

Date Reported: 2/3/2021

Dust Characterization (Level 2) - Enumeration - Identification of Biological & Non-Biological Particles by Optical Microscopy (EMSL Test Code M281 & Method MICRO-SOP-402)

Lab Sample Number	000000000-0009			000000000-00010		
Client Sample ID	9			10		
Sample Location	Location 1			Location 2		
Sample Type	Amorphous Bulk			Amorphous Bulk		
Weight Analyzed (mg)	0.455			0.425		
Particle Types	Raw Count	Count/mg	% of Total	Raw Count	Count/mg	% of Total
Particles of Plant Origin:						
Pollen	12	26	0.0	30	71	0.0
Fern/Moss Spores	-	-	-	-	-	-
Cellulose Fibers	210	462	0.1	405	952	0.1
Starch Particles	28	62	0.0	62	150	0.0
Trichomes	-	-	-	-	-	-
Other Plant Particles	-	-	-	-	-	-
Algae	-	-	-	-	-	-
Diatoms	-	-	-	-	-	-
Fungal Matter	3,125	6,880	1.3	1,875	4,410	0.5
Particles of Animal Origin:						
Skin Cells	31,250	68,800	13.1	48,750	115,000	13.0
Animal Hair	-	-	-	-	-	-
Mites	-	-	-	-	-	-
Insect Fragments	10	22	0.0	17	40	0.0
Non-Biological Particles:						
Opaque/Dark Particles	15,625	34,400	6.6	12,500	29,400	3.3
Glass Fibers	-	-	-	-	-	-
Synthetic Fibers	7	20	0.0	16	38	0.0
Translucent/Transparent Particles	187,500	413,000	78.9	312,500	734,000	83.1
Total	237,767	523,672	100	376,155	884,061	100

Analytical Sensitivity =	2	2
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High levels of particulate can obscure each other and lead to underestimation. Identification of starch particles using this method is limited to particles with a distinct hilum, fissures, or lamellae. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.

Report Date **Report Revision**

2/3/2021

R0

Revision Comments

Initial Report

Vincent Iuzzolino, M.S.
Microbiology Laboratory Director



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EMSL Order ID: 372101193
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Particle Glossary

Particle ID	Description
Algae	Algae are a diverse group of photosynthetic organisms that are mostly found in aquatic ecosystems. In our identification we include eukaryotic algae, such as green algae, as well blue-green algae. Blue-green algae are cyanobacteria and not included in modern definitions of algae. Microscopic algae can range from a few micrometers in size to a few hundred micrometers. It has been estimated that about 200,000-800,000 species exist.
Animal Hair	Hair is a keratinized filament that can vary in length from just a fraction of an inch to about a meter long (3.3 feet). Our animal hair identifications include hair from animals such as cat, dog, and wool that is typically dyed for use in rugs or clothing. Wool is made of animal underhairs that are soft, thin, and curly.
Cellulose Fibers	These fibers are biologically-derived from bark, wood, leaves, or other plant parts and used to make textiles (clothing fabric), drywall paper, ceiling tiles, and paper products. Cotton and other natural fibers are grouped in this identification.
Diatoms	Diatoms are a major group of microscopic algae found in oceans, waterways, and also in soil. They are unicellular and may occur as solitary cells or in colonies. Often we will see the shell of the diatom that remains after their death which is made of silica. Indoor sources may include diatomaceous earth used to control insects.
Fern/Moss Spores	Ferns and mosses do not flower or produce seeds but reproduce sexually by making spores. Spores are dispersed by the wind and can be found both in the indoor and outdoor air during times of heavy spore production. Indoor sources are rare unless they are found as houseplants.
Fungal Matter	Fungal matter includes the fungal spores, hyphae and fruiting structures combined. Fungi are found growing in all ecosystems on earth and spores can travel a long distance in the air. Indoor sources may come from water damaged building materials from flooding or leaks as well as on condensing surfaces or growing in house dust in humid environments.
Glass Fibers	These fibers are composed of non-crystalline fibrous glass and are most commonly found in fiberglass insulation, ceiling tiles, and sound insulation. Significant concentrations of glass fibers in a sample may indicate failing construction materials or recent renovation activities.
Insect Fragments	Insect fragments are recognizable insect parts such as fly legs, hairs, wing membrane hairs or fragments, Lepidoptera wing scales, carpet beetle larval hairs, antennae, and other various body parts of common indoor pest insects. Significant number of insect parts in the indoor environment may be an indicator of an infestation or inadequate housekeeping.
Mites	Mites are the most common of all arthropods. Indoors, the most commonly found mites are the house dust mite (<i>Dermatophagoides farinae</i> , the American house dust mite or <i>Dermatophagoides pteronyssinus</i> , the European house dust mite). Fungivorous mites may also be present if mold growth exists indoor. These mites feed on the growing mold and can disperse spores that stick on their bodies to other areas of the building as they move around.
Opaque/Dark Particles	This is a large category of particles that are unrelated other than being dark or black under the light microscope. These particles may include paint dust, rust, dark clays, soil, insect droppings, soot, char, rubber dust, metal dust, and other non-specific organic dust.
Other Plant Particles	We include fragments from wood, leaves and various other plant structures that do not fit into other categories. Typically these come from outdoor sources through aerial dispersion or tracked inside with the occupants. Indoor sources include houseplants.



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Skin Cells	Skin cells are the epithelial cells or fragments of skin, also called dander, that are shed from humans or other animals. Indoor sources include humans and common pets like dogs, cats, or potentially any furry pet. Skin cells make up a large portion of household dust and can be transported through the air. Dander can build up in carpets, mattresses and pillows and are a major food source for dust mites under the right environmental conditions.
Starch Particles	Starch particles or grains are produced by plants for energy storage. Indoor source may come from body powders, baking flour, starchy vegetables and other processed foods containing starch.
Synthetic Fibers	Man-made fibers used in clothing, upholstery and rugs, as well as other applications. Rayon, nylon, and polyester fibers are common types.
Translucent/Transparent Particles	Indoor sources of translucent/transparent particles include gypsum from drywall, glass fragments, isotropic crystals, remnants of glue from carpet backing, fly ash, aerosolized urethane, mineral efflorescence, and starch lacking characteristic morphology.
Trichomes	Trichomes are plant "hairs"; specifically, fine epidermal outgrowths or appendages on plants. Sources include indoor and outdoor plants.