



There are presently no standards set by OSHA or the ACGIH regarding the allowable amount of airborne fungi in a building or workplace. Microbiological evaluations usually involve a comparison of the quantity of organisms found inside a building versus outdoors. Due to HVAC filtration, inside microbial levels are generally lower than outside levels. In areas close to entrances and exits (reception areas, shipping area), lower inside levels may not be observed because windows are open and/or HVAC filters are not installed. The comparison of dominate types of organisms detected inside verses outside should be made to determine if amplification of fungi indoors and a possible building related source of microbials is present. Look for possible water sources—stained floors, walls, ceiling tiles. In winter months when outside fungi levels are lower, compare a complaining area to a non-complaining area, or an area which has no water damage to one that shows visible evidence of water damage. If there are different organisms present inside that are not outside, and these organisms are present in significant concentrations, a building related source may be indicated. Although there are no absolute standards, a numerical guideline (see Mold Interpretation: Surface Samples) published in *The Synergist* (Nov 2001) can also be used to help interpret fungal data (See Table 1 on page 2).

Fungi that are indicators of initial or recent indoor moisture infiltration are *Cladosporium*, *Aspergillus* and *Penicillium*. Generally, *Cladosporium* is one of the most abundant fungi identified in outdoor air sampling. Basidiospores are also very common outdoors and will dominate in woodland/forest areas especially after a rain or before noon. Ascospores are another common outdoor fungi typically found in high concentrations after rainy weather.

*Chaetomium* and *Stachybotrys* (produces black colored colonies that grow on cellulose containing materials) are usually associated with long-standing water or moisture problems. *Fusarium* and *Ulocladium* are other water-associated fungi found indoors.

Hyphal fragments and fruiting structures can also be noted on the spore counts and can indicate growth of the fungus on building materials.

**Table 1.** Proposed Guidelines for Fungal Spores from *The Synergist*

Type	Normal Background*	Possible Contamination Source	Probable Contamination Source
Air Samples from Residential Buildings	<5,000 spores/m <sup>3</sup> † <500 cfu/m <sup>3</sup>	5,000-10,000 spores/m <sup>3</sup> 500-1,000 cfu/m <sup>3</sup>	>10,000 spores/m <sup>3</sup> >1,000 cfu/m <sup>3</sup>
Air Samples from Commercial Buildings	<2,500 spores/m <sup>3</sup> <250 cfu/m <sup>3</sup>	2,500-10,000 spores/m <sup>3</sup> 250-1,000 cfu/m <sup>3</sup>	>10,000 spores/m <sup>3</sup> >1,000 cfu/m <sup>3</sup>
Dust Samples	<100,000 spores/g <10,000 cfu/g	100,000-1,000,000 spores/g 10,000-100,000 cfu/g	>1,000,000 spores/m <sup>3</sup> >100,000 cfu/g
	<50,000 mycelial frags/g	50,000-100,000 mycelial frags/g	>100,000 mycelial frags/g
Bulk Samples	<100,000 spores/g <10,000 cfu/g	100,000-1,000,000 spores/g 10,000-100,000 cfu/g	>1,000,000 spores/m <sup>3</sup> >100,000 cfu/g
	<50,000 mycelial frags/g	50,000-100,000 mycelial frags/g	>100,000 mycelial frags/g
Swab Samples	<10,000 cfu/in <sup>2</sup> <1,500 cfu/cm <sup>2</sup>		>10,000 cfu/in <sup>2</sup> >1,500 cfu/cm <sup>2</sup>
	Tape Samples	NSFM or NSFB** 1-5%	5-25%

\* Types and relative proportions of fungal spores should be similar to outdoors.

\*\* NSFM = no significant fungal material; NSFB = no significant fungal biomass

† (see Mold Interpretation: Surface Samples)

**Table 2. ESIS EHL Debris Ratings for Air-O-Cell™ Analysis**

<b>Rating</b>	<b>Description</b>	<b>Effect on Results</b>
<b>None</b>	Visible trace not observed.	No fragments or debris reported
<b>Trace</b>	Minimal amount of debris observed. Average field of view obscured by 1-10%.	Counts unaffected
<b>Low</b>	Small amount of debris observed. Average field of view obscured by 10-25%.	Counts mostly unaffected
<b>Medium</b>	Moderate amount of debris observed. Average field of view obscured by 25-75%.	Actual counts may be higher than reported results due to increased amount of debris
<b>High</b>	Large amount of debris observed. Average field of view obscured by >75%.	Counts cannot be performed. Presence of observed fragments and spores noted on report.

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