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## RE: HEALTHY LIVING

### THE MOLD ISSUES

The growth of molds and mildew in residential construction can be overwhelming unless you understand the complexities.

#### Introduction

Since the mid-1990's there has been an epidemic of law-suits and claims filed against builders, contractors, property managers and insurance companies regarding the growth of toxic mold and mildew in residential construction. The law-suits and the adverse health caused to the occupants of the infested homes by the toxic-mold are well publicized by the media. It is expected that adverse health issues related to toxic molds will continue to proliferate if proper initial design and corrective actions are not taken during the life of the building. At the same time insurance companies are trying to exclude coverage of remediation of molds. Today, liability associated to the growth of molds and mildew, is the most serious environmental concern facing the residential construction and insurance industry. The insurance industry estimates that during the past decade more than 9,000 toxic-mold lawsuits were filed in North America. Farmers Insurance allegedly claimed that it will drop 700,000 homeowners in the state of Texas when their policies expire because of massive water damage and mold claims. Builders through various organizations are drafting legislation that is expected to tighten building standard and form a building standard commission. Builders are finally becoming more aware of mold-resistant building practices.

The growth of molds can be prevented by having a proper understanding of the complexities of molds and the conditions under which it proliferates. It is imperative that homes be designed as a system and the usage of appropriate construction materials can reduce the proliferation of molds and mildew. The prevention of dew-point (condensation) in walls, usage of dry building materials and the prevention of water ingress (roof leaks, sewage backup, burst pipes, etc.) into the building are the tools to combat mold growth and subsequent infestation.

## **What are molds?**

Molds are naturally occurring microorganisms that are neither plant nor animal. Molds and its spores are found in every region in North America. Under ambient conditions mold spores can exist. It is only when the living conditions for molds are enhanced by the influx of water that spores will proliferate to a degree that could threaten health of the building occupants and cause building damage. As long as water is present, toxic and nontoxic molds will reproduce. If the building is dry, molds will not proliferate. Improper building design, faulty building techniques, builder shortcuts during the construction boom and some materials that serve as food for molds are commonly blamed for mold moving into new homes as fast as the owners. Constant moisture in walls can destroy a house from within, rotting wood, devouring the paper of sheetrock and glues that hold the particle board together, etc.

The presence of molds can be tested through surface testing (swab or tape contact) or air sample. However testing for molds is not a conclusive measurement of the amount of mold present or the amounts to which people are exposed. If molds could be seen or smelled, it is a concern and should be removed.

## **Health Effects**

The most common health problems associated with mold exposure are respiratory ailments that include runny nose, cough, congestion, allergic reactions and

asthmatic attacks. There are some established permissible exposure limits for molds in the work place, schools, etc. Some molds emit chemicals called *mycotoxins*. Mycotoxins if present in sufficiently high concentrations can cause serious health problems. There is no complete list of molds that are toxic to humans. However, the Center for Disease Control (CDC) has identified approximately 25 toxic-molds out of 99,000 known molds. However, effects of airborne mycotoxins are not fully understood.

The most published toxic mold is *Stachybotrys Chartarum*, a greenish-black mold often found inside wet walls, *Stachybotrys* feeds off organic material and it requires a steady supply of water. It grows rapidly in high cellulose material such as fiber board, wooden structures, cellulose insulation, dry wall, etc. In 1997, CDC allegedly claimed that *Stachybotrys* and other molds may have played a large role in the development of infant lung disease. However, these claims are under review. There are additional claims that *Stachybotrys* produces potent toxin that affect the immune system, central nervous system, upper and lower respiratory systems, eyes and skin.

## **Prevention of molds**

Mold spores are always present in the air, on our bodies and construction materials. It is impossible to build a mold-free house. But what can be achieved is to deny molds of the conditions for active growth. Molds require oxygen, food and water to become active. Water is the single element that can be easily controlled to effectively prevent

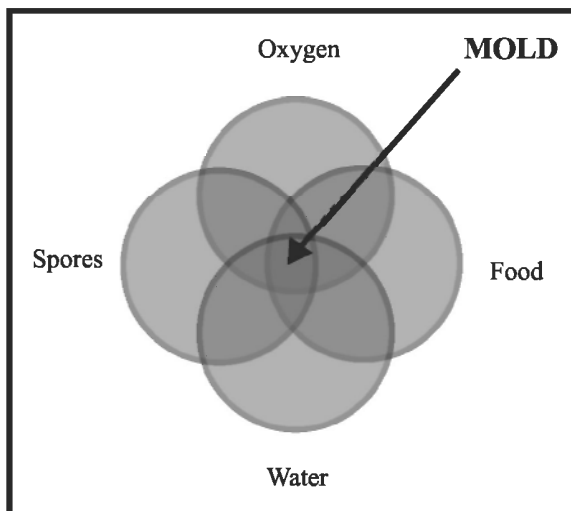
mold growth. Water can enter into a home by various methods such as: air infiltration, rain, roof leaks, sewage backup etc.

In the design stage of construction, installation of low air permeance insulation such as spray foam e.g. **SEALECTION™ 500** should be employed. Low air permeance insulation prevents the uncontrolled movement of air through wall assemblies. Hot air holds more water in the vapor state than colder air. When the hot humid air comes into contact with the cold sheet rock on the inside of houses in the summer, the vapor condenses to liquid water that triggers the growth of molds. The usage of loose fill insulation such as fiber-glass and cellulose allows the free movement of hot humid air through wall assemblies. It must also be emphasized that using wet blown cellulose, requires adequate drying of the cellulose.

Design of rain screens in construction also reduces the ingress of water. Material with moisture content higher than 19% is a regular occurrence in on-site building construction. The air space in combination with the breathable spray foam insulation having low air permeance allow the construction moisture to leave the wall assemblies before infestation can occur. The usage of **SEALECTION™ 500** is a positive way in designing buildings free of mold-infestation.

As part of an on-going preventative maintenance, immediate corrective action to water damage caused by burst pipes, roof leaks, sewage back-ups etc. to buildings must be employed to prevent mold proliferation.

## Conditions for Mold Growth



Suggestions for better building practices from Engineered Wood Association, formerly the American Plywood Association, at [www.apawood.org](http://www.apawood.org), click on “design/build” and then click on “build a better home”

Mold and health information from the Centers for Disease Control and Prevention:

[www.cdc.gov/nceh/airpollution/mold](http://www.cdc.gov/nceh/airpollution/mold).

National Association of Home Builders, [www.moldtips.org](http://www.moldtips.org). How to prevent molds and what to do when you see it.



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## INDOOR AIR QUALITY

### What is air quality?

Indoor air quality generally refers to the quality of the air in a home or building.

### Why does indoor air quality matter?

The air quality of our indoor environment affects our health and often contributes to the structural degradation and building failures within our homes and buildings.

The Environmental Protection Agency (EPA) lists poor indoor air quality as the fourth largest environmental threat to our country. Every year poor indoor air quality costs businesses more than one billion dollars in medical costs and 6 billion dollars in employee sick leave and lost production. Homeowners and workers are becoming more educated on the long-term effects of their environment on their health.

The American Lung Association estimates that 85% of people don't realize the air indoors may be a health hazard. Research indicates that people spend approximately 90% of their time indoors. Thus for many people, the risk to health may be greater than that of outdoors.

### What is indoor air pollution?

Indoor air pollution consists of toxic gases, or particles that can harm your health. These pollutants can build up rapidly outdoors to levels much higher than those found indoors. The construction of tighter homes without fresh air supply can allow the indoor air quality to deteriorate to harmful levels. It is not easy to identify a single reason for the indoor air quality, because of the number and variety of possible sources, causes and varying individual sensitivities. A few of these factors are contaminants, bacteria, molds, pollen, and viruses. These contaminants may breed in stagnant water accumulated in places like humidifiers and drains.

Chemical contaminants can be from indoor or outdoor sources, cleaning substances, gasses, tobacco smoke, etc. Houses constructed with leaky building envelope can allow particles of dust, dirt and other air born chemicals to enter, substances such as pesticides, smog, etc., may be drawn into the home or building from outdoors.

### Moisture and Humidity

Moisture and dirt can cause the presence or biological contamination such as mold. High humidity levels contribute to the proliferation of molds. Extremes in humidity levels can lead to discomfort. Extreme air temperatures and inadequate air circulation can significantly affect comfort levels.

Common problems or failures that occur include: musty odors, mold growth, window condensation, structural rot, back drafting appliances, damp basements or build up of ice on roof edges, and high utility costs. Pollutants can also enter through air leaks in the structure.

### Building Materials

Many asbestos products containing formaldehyde can be found in the home or buildings, including roofing and flooring materials, as well as wall and attic insulation. Plywood and carpets are contributors of pollutants that can have a negative impact on indoor air quality.

Insulation is one of the major building products that has a long term affect on the air you breathe. **SEALECTION™ 500** insulation will allow you to insulate your home or building, without harmful

emissions, which improves the indoor air quality.

All of us face a variety of risks, to our health as we go about our day-to-day lives. Health effects from indoor air pollutants may be experienced soon after exposure, or possibly years later. Indoor air pollution is one risk that we can do something about.

Inspect potential sources of pollution such as:

- ▶ Air intakes
- ▶ Air Filtration
- ▶ Duct Work
- ▶ Ceilings
- ▶ Crawl Spaces and Surfaces
- ▶ Insulation, Water Damage - Wet or Damp Ceilings or Walls

Poor indoor air quality can cause or contribute to the development of chronic respiratory diseases such as asthma and hypersensitivity pneumonitis. In addition, it can cause nausea and fatigue. People who already have respiratory diseases are at greater risk.

### Building a New Home or Building

This provides you an opportunity for preventing indoor air problems. Express your concerns about air quality to your architect or builders. Insulation is one of the major building materials that has a long term affect on the air you breath. **SEALECTION™ 500** insulation will allow you to insulate your home or building without any harmful emissions, which improves the air quality. It provides a relatively dust free environment, with very little air leakage for new construction.