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FLOORS

# Indoor Air Quality / Volatile Organic Compounds

## WHAT IS INDOOR AIR QUALITY AND WHY IS IT IMPORTANT?

The U.S. Environmental Protection Agency defines indoor air quality as, “the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants.” Poor indoor air quality occurs when there is a buildup of pollutants in the home, and it can affect health, comfort, productivity, cognitive function, and work performance. Since humans spend up to 90% of their time indoors, it is important to create a healthy indoor environment for all.

Sources of pollutants include moisture, mold, bacteria, particulates from smoke, inadequate air circulation/ventilation, carbon dioxide and other Volatile Organic Compounds (VOCs). High temperature and humidity levels can also increase concentrations of some pollutants.

Some health effects may show up shortly after a single exposure or repeated exposures to a pollutant. These include irritation of the eyes, nose, and throat, headaches, dizziness, and fatigue. These immediate effects are often short-term and treatable. Soon after exposure to some indoor air pollutants, symptoms of some diseases such as asthma may show up, aggravated, or worsened. Other health effects may show up years after exposure has occurred or only after long or repeated periods of exposure. Even if symptoms are not noticeable, it is wise to try to improve the indoor air quality in your home. Reactions to indoor air pollutants depends on several factors, including previous medical conditions. Many reports and studies state that children, elderly, and low-income populations may be disproportionately impacted by indoor asthma triggers, secondhand smoke, mold, radon, and other indoor pollutants.

Indoor air quality can be improved by augmenting ventilation, purchasing an air cleaner and through source control. For example, gas stoves can be adjusted to decrease the number of emissions. Lastly, it is important to educate yourself on low-emitting materials standards. Certifications such as LEED, Greenguard, FloorScore, Mas Green Certified, and CDPH 01350 all ensure products are low-emitting VOCs.

## INDOOR AIR QUALITY STUDIES

### **The Benefits of Wood:**

Wood is particularly interesting, as it is a natural, renewable, low-carbon, reusable, and recyclable building material that already is used widely in the construction industry. More and more studies have appeared on the possible health benefits of wood. In 2020, scientists from Aalto University, the University of Eastern Finland, and the University of Helsinki reviewed 265 publications on indoor environment quality. It was found that using wood as an interior material affects the indoor environment of a building in several ways: wood emits chemical compounds, buffers the moisture content of indoor air, and influences the acoustical as well as bacterial environment. Overall, wood stabilizes humidity fluctuations of indoor air, induces positive feelings in occupants, and inhibits certain bacteria.

### **The Benefits of Green Buildings:**

Moreover, in 2016 a group of experts from Harvard School of Public Health, Syracuse, Upstate Medical University, and United Technologies concluded that office workers have lower cognitive function when they work in offices inside conventional buildings which tend to have low indoor air quality. Control groups were put into two separate environments: one simulating green building indoor conditions and the other simulating conventional building conditions. Everyday tasks were recorded for how well they were performed: activity level (basic, applied, and focused), task orientation, crisis response, information seeking, information usage, breadth of approach, and strategy. The study showed that office workers in green buildings had significantly better cognitive function than those in conventional buildings. The study also concluded that carbon dioxide (CO<sub>2</sub>) and VOCs caused significant cognitive deficits at levels found in conventional buildings. Increasing the ventilation of outdoor air in green buildings lowered the exposure of said indoor environmental pollutants and showed higher cognitive function.

## References

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