

Michaels Engineering IAQ Brief

FORMALDEHYDE IN BUILDINGS

SUGGESTIONS...

Do you have certain Indoor Air Quality topics you'd like to know more about? Send an email with your suggestion to the author listed below and your topic might become a future IAQ Brief!

DID YOU KNOW...

...The most common source of formaldehyde in buildings is from the resins used in composite wood products (plywood, particle board, wafer board).

...Common symptoms of exposure to formaldehyde include irritation to the eyes, nose, and throat, in addition to coughing, headaches, and nausea.

For More Info...



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→ FORMALDEHYDE IN BUILDINGS - A CAUSE FOR CONCERN?

Concerns about exposure to formaldehyde in buildings have received recent media attention, especially following hurricane Katrina. Levels of formaldehyde in the FEMA trailers occupied by those who lost their homes reached up to 590 parts-per-billion (ppb). This is more than 6 times the typical indoor concentration. However, is formaldehyde a concern in most buildings?

Formaldehyde is a common organic chemical that is used to produce thousands of products, including bonding agents, disinfectants, textile and industry dyes, explosives, and resins. The most common source of formaldehyde in buildings is from the resins used in composite wood products (plywood, particle board, wafer board). Formaldehyde is also produced when other chemicals break down, and during combustion of various fuels. The build-up of formaldehyde in buildings became a larger concern following the energy crisis of the early 1970s, when we began tightening up our building envelopes to conserve energy. The recent "green" initiatives have compounded concerns about formaldehyde levels by further tightening our building and by encouraging the use of recycled and composite wood materials, which may include higher levels of formaldehyde and other volatile chemicals.

Health effects and levels of sensitivity to formaldehyde exposure vary between individuals. Common symptoms of exposure include irritation to the eyes, nose, and throat, in addition to coughing, headaches, and nausea. The International Agency for Research on Cancer (IARC), part of the World Health Organization, has also concluded that formaldehyde is a human carcinogen.

While formaldehyde exposures can result in adverse health effects, are the levels typically present in buildings elevated enough to elicit these effects in non-sensitive individuals? A 2005 study by Indoor Environmental Engineering, a California-based IAQ research firm, found that 98% of the homes they tested exceeded California's 2008 Chronic and 8-hour Reference Exposure Levels for irritant effects (7.3 ppb), and that 28% of the homes exceeded 45 ppb. Other studies suggest that these elevated levels of formaldehyde may persist for several years. A 2006 Japanese study suggested that most VOCs, with the exception of formaldehyde and alpha-pinene, will experience most of their off-gassing within the first year. Formaldehyde and alpha-pinene experience elevated off-gassing for a longer period of time.

Buildings that are several years old and do not have new interior finishes or furnishings are unlikely to have elevated levels of formaldehyde. However, you may consider measuring formaldehyde levels if occupants experience symptoms similar to those described above, if the building is new or recently renovated, or if new furnishings and finishes have been installed.