



HBN Analysis of Formaldehyde Council's Defense of Formaldehyde in Batt Insulation

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By Tom Lent, Healthy Building Network

On January 21, 2009, the Healthy Building Network (HBN) published an [article](#) in its "Did You Know" series pointing out that fiberglass batt insulation can release potentially hazardous levels of formaldehyde, a known cancer-causing chemical. The article also noted that an increasing number of [batt insulation products](#) are now available with no added formaldehyde.

The article was based upon an [HBN research memo](#) also published in January of this year which reviewed the state of standards and research on fiberglass insulation using phenol-based formaldehyde binders. The HBN memo concluded that formaldehyde releases can reach hazardous levels - even through drywall - and warrant avoidance.

Major points in the HBN research memo were that:

- Formaldehyde is a known carcinogen and respiratory irritant
- A key study that had been used to argue for the safety of formaldehyde in insulation actually showed significant formaldehyde emissions from fiberglass batt insulation near or in excess of established standards
- Current standards are not health protective and not designed for use on insulation products installed in homes.
- Multiple formaldehyde-free alternatives are available
- Avoidance of all formaldehyde binders is attainable and warranted

Shortly after HBN published its article, the Formaldehyde Council, Inc. (FCI) - the trade association formed to promote the interests of the formaldehyde industry - published a [letter to HBN](#) on its blog attacking HBN's findings.

In its letter, FCI made many assertions, including that formaldehyde is only responsible "for the occurrence of a rare cancer tumor" and "only in the worker population." This assertion stands in contrast to the California Air Resources Board assessment which estimates that current formaldehyde exposure in buildings is responsible for about 4,000 excess cases of cancer in California alone, which HBN calculates into over 35,000 excess cases of cancer nationwide.

The FCI also noted that its members' products meet current indoor air quality standards. HBN had already made this point in its research memo, noting the inadequacy of current standards to protect from cancer risk. The FCI also accused the HBN memo of being a promotion for a single manufacturer of formaldehyde-free insulation. Happily for designers and builders concerned about the health impact of insulation, as noted in the HBN memo, there are actually already four different manufacturers offering alternative batt products.

In the pages that follow, we provide a detailed point-by-point analysis of the assertions made in the FCI letter.

Complete HBN Analysis of Assertions by the FCI

Response to assertions made in letter from Betsy Natz, Executive Director, Formaldehyde Council, Inc. to Tom Lent, Healthy Building Network, dated February 17, 2009 delivered by email and posted in the FCI blog.

"[F]ormaldehyde may be responsible for the occurrence of a rare cancer tumor but only in the worker population where there was high exposure to the chemical. This association, however, remains in dispute."

The Formaldehyde Council apparently does not understand the basic epidemiology behind the current science of formaldehyde and cancer. Epidemiological studies focus on the study of worker populations because they provide the best opportunity for a relatively controlled study of the impacts of long term exposure to different concentration levels. This helps epidemiologists project impacts over larger general populations with variable exposure levels. How many of those "rare cancer tumors" are actually occurring? The California Air Resources Board estimated that *"if the California population were exposed to current, average indoor levels of formaldehyde over a lifetime, ARB staff estimate that about 4000 excess cases of cancer would be expected to develop, or about 115 excess cases of cancer per million people exposed"* (CARB Fact Sheet: "Indoor Air Quality Guideline: Formaldehyde in the Home" (Aug. 2004) <http://www.arb.ca.gov/research/indoor/formaldGL08-04.pdf>). Extrapolated to the population of the United States (currently over 305 million people (US Census Bureau, U.S. POPClock Projection <http://www.census.gov/population/www/popclockus.html> accessed 3/3/2009), that would translate into over 35,000 excess cases of cancer. (*Note: the Formaldehyde Council references this same fact sheet later in their letter*)

If the general population is experiencing that kind of cancer incidence at average indoor levels, the cancer rate at the high exposure levels that the Formaldehyde Council suggests may be going on in the workplace is probably much worse.

"You discuss in detail the levels of emissions measured by Axtel in different building construction scenarios, most of which are not representative of what would be found in a completed/occupied building."

Only the unpainted drywall samples are not likely to be found in most complete/occupied buildings and are useful to understand the effects of each type of wall profile that was tested: with and without facing and with and without a vapor barrier. What is remarkable is that even *with* a kraft facing or a vapor barrier, the insulation still emitted enough to be close to the 50% threshold limit of the current reference exposure level (REL) - and all assemblies would exceed the threshold at the new REL recently proposed by the State of California (cited in the original memo).

"... You conclude that those levels '...are near or in excess of established standards' citing to California's Collaborative for High Performance Schools (CHPS) 1350 Standard. In fact, many of the fiberglass insulation products manufactured with phenol formaldehyde binder comply with the 1350 Standard and are accepted by the CHPS program."

True, several manufacturers have had a sample of their insulation pass the necessary 14-day emissions test to get on the CHPS list, but that does not change the results of Axtel's tests nor the conclusions in the HBN memo. Axtel's tests showed the unfaced fiberglass emitting more than the 01350 allows with the current REL even after 58 days. Even the two samples with the best barriers still emitted 44% and 63% of the allowable limit. The poly-protected one then shot back up to 73% of the limit at 58 days. That 27% margin is little comfort if you have multiple sources of formaldehyde in the house all adding to the exposure. The new REL proposed by the State will make this all moot. All of the sample wall profiles emitted more than the new REL would allow at both 14 and 58 days.

“Your suggestion that ‘[u]nresolved questions about the modeling raise questions even about whether these actually passed’ is unsupported by any facts presented in your paper.”

We have reexamined the data and resolved a question we had about consistency of the results. The statement has been removed from the memo.

“You state that ‘Current formaldehyde emission standards are not health protective,’ but you offer no scientific support for your proposition. You appear to base your position on the fact that any exposure above one half of the chronic reference exposure level (CREL) for formaldehyde (1.25 ppb), which would include background exposure to formaldehyde, would result in adverse health effects. Such a position is preposterous. If background exposures to formaldehyde are unsafe, why hasn’t this risk manifested itself?”

The science on cancer exposure was settled long ago. As the CARB fact sheet referenced earlier states very clearly, there is “[n]o known level with zero risk” for cancer, reinforcing what has been found over and over in the scientific literature - that there is no safe level of exposure to formaldehyde. Yes, unfortunately background levels do result in cancers and, as noted above, the CARB has calculated that the current higher exposure levels in our homes, schools and office buildings, are leading to thousands more unnecessary cancers.

“You claim that the state of California recommends avoiding products with added formaldehyde. To support that position you cite the California Air Resources Board’s (CARB) Indoor Air Quality Guideline: Formaldehyde in the Home. The original version of that document stated, ‘...use formaldehyde-free fiberglass insulation, too.’ See page 6. The revised version, however, reads, ‘Use insulation materials that emit little or no formaldehyde, too; request emission test results to document low emissions.’ See page 6.”

The August 2004 version states “Use formaldehyde-free building materials.” It also explicitly notes: “Formaldehyde emitted from insulation materials installed in the ceiling or walls can enter living spaces in the home.” Insulation materials that emit enough formaldehyde to exceed the REL should not be considered to “emit little or no formaldehyde.”

“You raise the issue of whether formaldehyde-free insulation emits formaldehyde in excess of the 1350 limits in conjunction with your point that the state of California recommends avoiding products with added formaldehyde. (See your discussion on the results of the testing of the formaldehyde free insulation by the California Integrated Waste Management Board.) After raising this seemingly unrelated issue, you reference a letter from the California Department of Health Services written to Johns Manville in response to an inquiry from JM about this test. The letter you reference was attached as an Exhibit to JM’s Surreply in the NAD proceedings which we understand is not a public record. You do not mention in your paper how you came into possession of that letter...[G]iven the remarkable similarities between your claims and those of JM, one might view your document as a sophisticated advertisement for its formaldehyde-free insulation.”

The referenced letter is not identified as a confidential document and neither it nor our article constitute an endorsement of JM's product. There are currently four manufacturers of formaldehyde-free batt insulation, all of which are listed in the research memo: Knauf, Johns Manville, Bonded Logic and EcoBlue). A fifth manufacturer - Owens Corning - has produced a formaldehyde free product although it is not currently in production.

“[Y]ou certainly have a right to promote alternative insulation materials. However, you do not have the right to do so by publishing false, misleading and unsupported statements

about insulation products made with phenol formaldehyde binders. Your suggestion that there is scientific support for your position is simply not true. In fact, the opposite is the case. No health risk to building occupants from the exposure levels typically attributed to these insulation products has been demonstrated.”

Very nice turn of the phrase: “*No health risk to building occupants from the exposure levels typically attributed to these insulation products has been demonstrated.*” That is quite to the point of the memo. Typically, virtually no meaningful exposure is attributed to these insulation products under the assumption that the phenol formaldehyde binders used in fiberglass insulation do not emit substantial amounts of formaldehyde. The Axtel study clearly indicates that this assumption is misguided. At the 58-day mark, modeled formaldehyde concentrations from fiberglass insulation ranged from about 10-15 ppb. This means that these products can contribute very substantially to the 15-20 ppb average levels that the CARB found in their studies of homes, schools and offices from which they estimated the 4,000 excess cases of cancer.

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