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By E Mail

Ms. Dorothy Shimer
Research Division, 5th floor
California Air Resources Board
P.O. Box 2815
1001 I Street
Sacramento, CA 95812

Re: Comments on draft report entitled Indoor Air Pollution in California

Dear Ms. Shimer:

Owens Corning appreciates the opportunity to submit comments to the California Air Resources Board (CARB) regarding its draft report to the California Legislature entitled Indoor Air Pollution in California (Report). Owens Corning is the largest manufacturer of fiber glass building insulation in the United States. It has produced fiber glass insulation, for the western United States, at its plant in Santa Clara, California since 1948.

INSULATION PROVIDES ENERGY SAVINGS, ENVIRONMENTAL AND PUBLIC HEALTH BENEFITS

Energy savings gained through installed insulation products reduces the consumption of fossil fuels used to heat and cool buildings. In turn, reduction of fossil fuel consumption decreases the volume of air pollutants released into the atmosphere. Many of these pollution reductions and health benefits were identified in two recent studies by researchers from Harvard University's School of Public Health.

In the first of those articles[1], the authors concluded that if all new U.S. homes were insulated to meet the 2000 International Energy Conservation Code, between 2001 and 2010 it would:

[1] Nishioka Y, Levy J, Norris G, Wilson A, Hofstetter P and Spengler J 2002. Integrating Risk Assessment and Life Cycle Assessment: A Case Study of Insulation. *Risk Analysis* **22**: 1003-1017. (Attachment A)

- Save 3 X 10^{14} BTUs of energy;
- Reduce emissions of PM2.5 from power plants by 1,000 tons;
- Reduce NOx emissions by 30,000 tons;
- Eliminate 40,000 tons of SO2 emissions;
- Result in 60 fewer premature deaths;
- Eliminate 2,000 asthma attacks and
- There would be 30,000 fewer restricted activity workdays.

The second article[2] reported that if existing U.S. homes were retrofitted with insulation to meet the 2000 International Energy Conservation Code, it would annually:

- Save 8 X 10^{14} BTUs of energy;
- Eliminate 3,100 tons of PM2.5 emissions;
- Reduce NOx emissions by 100,000 tons;
- Reduce SO2 emissions by 190,000 tons;
- Prevent 240 premature deaths;
- Prevent 6,500 asthma attacks and
- Result in 110,000 fewer restricted activity workdays.

THE ROLE OF BINDER IN INSULATION

Fiber glass building insulation contains a binder which holds the glass fibers together as a batt or blanket. It gives the finished insulation pack the ability to recover to its original thickness and shape, so as to produce its advertised insulating value, and provides the structural integrity that allows it to be easily installed in wall cavities. Most fiber glass building insulation is produced with a binder that is composed of a phenol-formaldehyde resin that is modified with urea. Because the binder is applied to the glass fibers which are then cured or polymerized in an oven there is very little free formaldehyde left in the finished product that could be emitted to the building environment.

THE DRAFT REPORT MISSTATES THE RESULTS OF THE TESTING PERFORMED BY THE CALIFORNIA INTERATED WASTE MANAGEMENT BOARD

At page 50, the draft Report, referencing the results from testing conducted by the California Integrated Waste Management Board (CIWMB), states:

[2] Levy J, Nishioka Y and Spengler J 2003. The public health benefit of insulation retrofits in existing housing in the United States. *Environmental Health: A Global Access Source* **2**:4 (Attachment B)

> In a recent study funded by the California Integrated Waste Management Board… investigators identified nine products in six categories that emitted formaldehyde at levels high enough to exceed the Section 01350 guideline level, as described in the Energy Efficiency and Sustainable Building measures (State of California 2002). When modeling was conducted on emissions from … thermal insulation, room concentrations were estimated to exceed 16.5 ug/m3 (13.5 ppb), the upper bound allowed for formaldehyde contribution from a single product under Section 01350 guidelines…

The Report does not accurately state the CIWMB findings for thermal insulation. Three samples of fiber glass insulation, two produced with phenol-formaldehyde containing binder referred to as standard product and one made with an acrylic based binder, and one sample of a spray applied cellulose insulation were tested. The CIWMB reported formaldehyde emissions from the samples were:

Product	**Formaldehyde Emission Factor 24 hours**	**Formaldehyde Emissions Factor 48 hours**	**Formaldehyde Emission Factor 96 hours**	**Classroom Concentration 01350**	**Office Concentration 01350**
Standard	12 ug/m2*hr	13 ug/m2*hr	14 ug/m2*hr	13 ug/m3	31 ug/m3
Standard	1.1 ug/m2*hr	0.43 ug/m2*hr	0.35 ug/m2*hr	0.34 ug/m3	0.78 mg/3
Acrylic	4.0 ug/m2*hr	6.5 ug/m2*hr	7.7 ug/m2*hr	7.5 ug/m3	17 ug/m3
Cellulose	4.0 ug/m2*hr	3.3 ug/m2*hr	1.7 ug/m2*hr	1.7 ug/m3	3.9 ug/m3

Contrary to the Report's characterization of the results, all of the fiber glass insulation products had formaldehyde emissions below the upper bound allowed by 01350 for use in classroom applications. The report states at page 44:

> One of the two alternative products… sold as formaldehyde–free also exceeded the concentration limit for the State office calculation only. Both of these [alternative] products had concentrations of formaldehyde at least 35 percent of Section 01350 concentration limit for classroom application.
>
> …Based on the four thermal insulation samples tested (two standard, two alternative), there appears to be little difference between standard and alternative products.

WHAT HAVE OTHERS SAID ABOUT THE IMPACT OF FORMALDEHYDE EMISSIONS FROM FIBER GLASS INSULATION

U.S. Consumer Product Safety Commission

In 1983, the U. S. Consumer Product Safety Commission (CPSC) issued a report on its findings regarding emissions from fiber glass insulation and fiber glass ceiling tiles.[3]

In a report to Peter Preuss, at that time Associate Executive Director of the CPSC, the Agency stated:

> …It is therefore concluded from these studies that fibrous glass insulation and ceiling tiles will have little impact on in-home levels of formaldehyde.

Industry Sponsored Third Party Testing

In 2004 various producers sponsored testing of their phenol-formaldehyde resin based binder fiber glass building insulation products to evaluate their emissions of formaldehyde in wall assembly construction. The emissions rate data was then utilized in indoor air quality modeling based on the Greenguard Certification Program criteria and California's 01350 construction specification to determine maximum modeled concentrations for a typical school and office environment. The results of the study conducted by Air Quality Science were summarized in a report prepared by C.W. Axten entitled *Formaldehyde and Total Volatile Organic Compound Emissions from Thermal Insulation Products*.[4] Dr. Axten concluded:

> Emission levels were used to calculate potential exposure concentrations of formaldehyde following the requirements of several environmental programs… The levels of formaldehyde were very low, with each wall assembly measured at less than 10 ppb. All measured emissions were less than the 1350 criteria of 16.5 ug/m3 or 13.5 ppb levels of formaldehyde within one week.
>
> The data were also reviewed relative to commercial or office space environments… all products met the Greenguard Indoor Air Quality Certified levels of formaldehyde, 50 ppb, within a one week period… All products except for one, were found to meet the California 1350 criteria… of 16.5 ug/m3 or 13.5 ppb for offices within the 2-week period…

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[3] Cohn M 1983. Summary of Formaldehyde in Products Project. September 1983 U.S. Consumer Product Safety Commission. (Attachment C)

[4] Attachment D

California's Collaborative for High Performance Schools

California's Collaborative for High Performance Schools (CHPS), is a forward looking effort by government and private industry to design and build sustainable schools that address the issue of healthy environments for their occupants. In fact, many of Owens Corning's fiber glass building insulation products are already listed on the CHPS web page of approved thermal insulation products.[5]

CONCLUSION

For over 20 years, testing and modeling has shown that fiber glass insulation manufactured by Owens Corning and others does not contribute significant amounts of formaldehyde to the building environment. Those same products have satisfied the requirements of newer programs instituted in the State of California to assess the safety of building products in the construction of sensitive buildings. Testing of alternative insulation materials, by the State of California, has not shown them to emit significantly different levels of formaldehyde from the standard products. In fact, the whole issue of formaldehyde emissions from fiber glass insulation appears to be moot within weeks after installation, often before the building is even occupied, as emissions by that time are either nonexistent or below recognized California standards.

Fiber glass building insulation is a valuable building material. It saves energy, reduces emissions of air pollutants and has a positive impact on the health of the citizens of the State. CARB must keep these facts in mind as it deals with indoor air issues. California must not unfairly portray a valuable building material as part of the problem when in fact it is part of the solution.

Sincerely,

Kenneth D. Gould
Senior Counsel
Regulatory Law

[5] http://www.chps.net/manual/lem_table.htm