

U.S. Experience with Socio-Economic Analysis: Formaldehyde Standards for Composite Wood Products

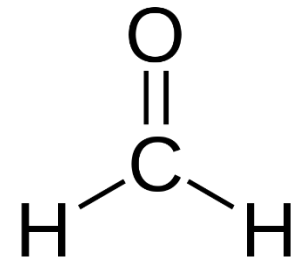
OECD Workshop on Socioeconomic Impact
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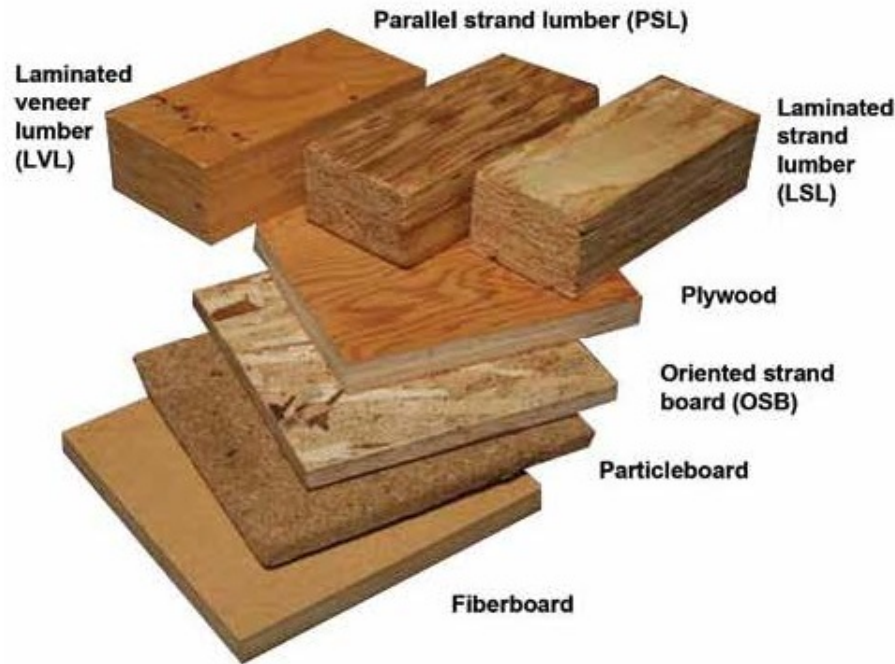
Formaldehyde in consumer products

- Formaldehyde is a known human carcinogen. It can also cause eye, nose, and throat irritation, as well as cause respiratory symptoms.
- Many household products emit formaldehyde. These include glues, permanent press fabrics, carpets, antiseptics, medicines, cosmetics, dishwashing liquids, fabric softeners, shoe care agents, lacquers, plastics and paper product coatings.
- Formaldehyde-based resins are often used as glues in making composite wood products.
 - These resins can continue to emit formaldehyde long after the products have been manufactured, leading to concerns about exposures and health effects.





Some examples of composite wood products



Hardwood plywood, medium density fiberboard, and particleboard are used in cabinets for electronics; door components; flooring; household furniture; kitchen & bath cabinets, vanities, and countertops; millwork; moulding; office furniture; paneling; shelving; store fixtures; and various other applications.



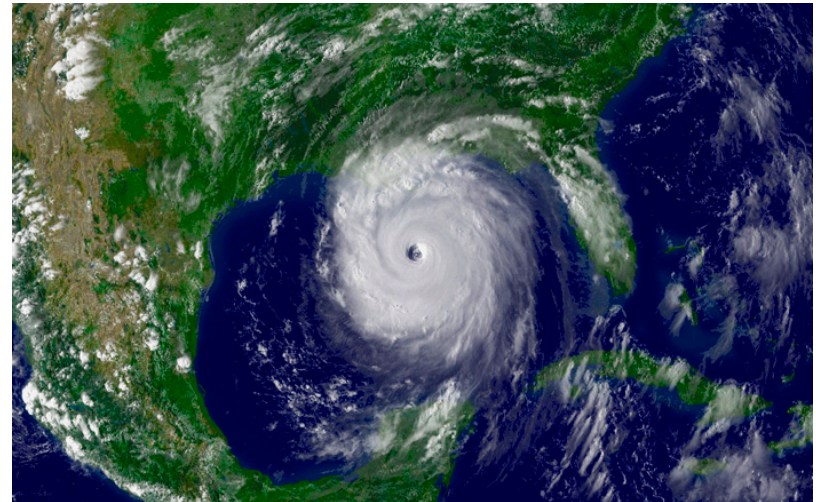
Regulatory development history

- 1980s U.S. Environmental Protection Agency (EPA) began investigating consumer exposure to formaldehyde from composite wood products.
- 2001 California Air Resources Board (CARB) began evaluating methods to reduce formaldehyde emissions from composite wood products.
- 2008 CARB issued Air Toxics Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products.
- 2008 EPA was petitioned to adopt the CARB standards nationally. The Agency began a new investigation into whether action might be appropriate to protect against risks posed by formaldehyde emitted from composite wood products.
- 2010 The Toxic Substances Control Act (TSCA) was amended to establish formaldehyde emission standards for composite wood products that are identical to the CARB standards. Congress directed EPA to consider a number of elements for inclusion in the implementing regulations, many of which are aspects of the CARB program.
- 2013 EPA published a proposed rule for public comment.
- 2016 EPA anticipates publishing a final rule.



External Forces: Hurricanes Katrina and Rita

- Hurricane Katrina hit the Gulf Coast in 2005. Hurricane Rita followed in 2008.
- Severe damage to many homes.
- The Federal Emergency Management Agency (FEMA) provided temporary housing: approximately 100,000 trailers.
- Many complaints about formaldehyde levels in these trailers.





California Formaldehyde Rule

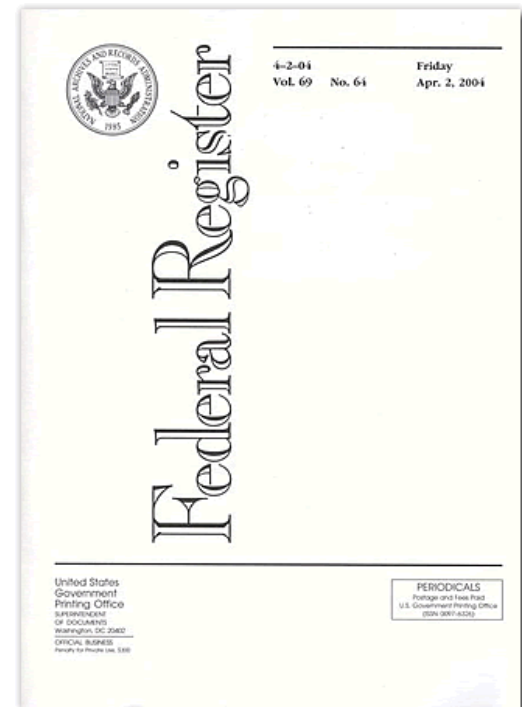
- The California rule establishes formaldehyde emission limits for 3 types of composite wood panels (hardwood plywood, particleboard and medium-density fiberboard). Panel manufacturers must demonstrate compliance through emissions testing and third-party certification.
- Finished goods sold in California must be made from compliant panels.
- Chain of custody requirements for panels and finished goods apply to panel manufacturers, distributors, importers, fabricators, and retailers. Requirements include product labeling and record keeping.
- Requirements apply to products whether they are produced in California, elsewhere in the U.S., or outside the U.S.
- The California rule became a *de facto* national standard in the U.S., and affected production throughout the world.





Federal Regulation of Formaldehyde by U.S. EPA

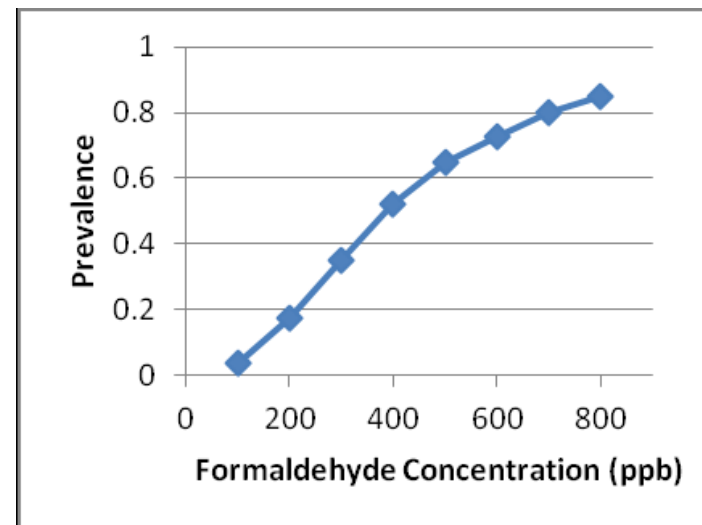
- In 2010, the U.S. Congress passed legislation amending the Toxic Substances Control Act (TSCA).
- The statute directs EPA to implement regulations establishing a national formaldehyde program modeled on the California rule, including identical emission standards.
- EPA published a proposed rule in 2013 and expects to publish a final rule this year. The rule and the supporting analyses are still being developed and undergoing review.





Determining dose-response functions to estimate health benefits

- EPA identified 9 categories of health effects associated with formaldehyde exposure.
- Only 2 of these were judged to have sufficient data for quantitative concentration-response modeling in support of the benefits assessment. Other endpoints were discussed qualitatively.
- There are often disputes about the shape of the dose-response curve, particularly at low doses.
- Benefits that can be quantified and monetized often receive more weight in decision-making. Unquantified benefits can lead to sub-optimal rule stringency.





Valuing reductions in fatal cancer risk

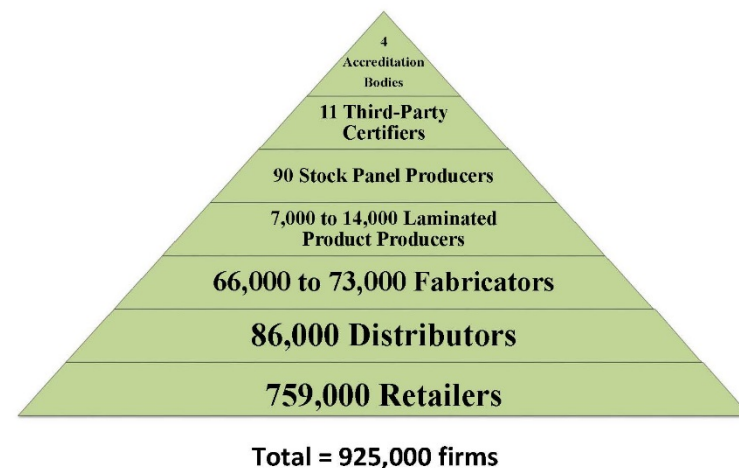
- EPA generally calculates the benefits of reducing the risk of death using the value of a mortality risk (VMR), which is calculated from the value of a statistical life (VSL).
- EPA's standard VSL estimate is based on a review of relevant wage-risk analyses of labor markets, as well as several contingent valuation studies.
 - The risks in these studies tend to be dominated by deaths associated with accidents or other immediate causes.
 - Thus the VMR reflects the willingness to pay (WTP) to reduce the risk of an immediate, accidental death with no additional complications.
- An individual's WTP does not include costs borne by others, such as medical costs paid by health insurance or government programs.
- So EPA's VMR does not represent the total benefit of reducing the risk of a lengthy illness with significant medical costs (e.g., cancer fatality).
 - As a result, EPA's VMR estimate is likely to underestimate the benefits of avoiding cancer fatalities.
- Ongoing discussion with our Science Advisory Board about how to address this.



Benefits of labeling, recordkeeping, and other administrative requirements

- In addition to setting emission standards, the statute directs EPA to include provisions relating to emissions testing, third-party certification, product labeling, chain of custody documentation, recordkeeping, and other administrative requirements for the supply chain.
- Even though many of these provisions were similar or identical to California's requirements, information was not available to quantify how much they contribute to the effectiveness of the rule.
- EPA's analysis quantified costs for many of these provisions, but not benefits.
- In general, the inability to quantify the benefits of many provisions makes options with less stringent requirements look artificially attractive.

U.S. Firms Subject to TSCA Formaldehyde Rule





Assessing substitutes

	<u>Simpler</u>	<u>More Complex</u>
Benefits of the Rule	Hazard comparison	Risk comparison Monetization
Costs of the Rule	Purchase price Equipment changes Energy usage Disposal costs	Learning curve Product quality Performance characteristics Technological innovation
Assessment Focus	Individual chemical	Sectors/Processes (multiple chemicals)



For more information

Formaldehyde rulemaking docket at [Regulations.gov](https://www.regulations.gov)

- Docket number EPA-HQ-OPPT-2012-0018
- This docket contains the proposed rulemaking, technical support documents, public comments, etc.
- The Economic Analysis for the proposed rule is at <https://www.regulations.gov/document?D=EPA-HQ-OPPT-2012-0018-0484>