

California Wood Industries Comments
Proposed Air Toxic Control Measure
For Formaldehyde in Composite Wood Products

These comments are submitted by the California Wood Industries Coalition ("CWIC") on the Air Toxic Control Measure for Formaldehyde in Composite Wood Products ("ATCM" or the "Regulation").¹

The California Wood Industries Coalition was formed in 2002 specifically in response to the development of this regulation. It has addressed this issue and other regulatory actions in California that impact composite wood manufacturers. The Coalition consists of all the major industries affected by this rule: the Composite Panel Association, Hardwood Plywood and Veneer Association, Formaldehyde Council, Inc., American Home Furnishings Association, Kitchen Cabinet Manufacturers' Association, Wood Moulding and Millwork Manufacturers' Association, American Wood Furnishing and Suppliers Association, American Forest and Paper Association and APA-The Engineered Wood Association. The overwhelming majority of the manufacturing businesses affected by this rule are members of this coalition. Over 95% of the composite panel producers and hardwood plywood producers and similar proportions of the manufacturing industries for wood furniture, kitchen cabinets, wood moldings, formaldehyde based adhesives, formaldehyde and engineered wood products and the distributors for these materials are represented by the associations in the Coalition.

This ATCM is unlike any other that CARB has developed. It is not simply a "content" regulation measuring the amount of a chemical in a container – it restricts dynamic emissions from a range of panel products and similarly from a host of household objects such as furniture and cabinets that are made from them. The emissions do not necessarily relate to the amount of formaldehyde in the product.

We believe that it is the most expensive ATCM in terms of cost per pound of reduced emission that CARB has ever promulgated. Even by CARB's very conservative assumption, the cost would be \$127 per pound, \$254,000 per ton! We believe the actual cost is more likely to be four times that amount. The health benefits to the people of California from this extraordinarily costly regulation would be virtually nil.

The use of ceiling values requires manufacturers to produce at substantially lower emission targets because of the inherent variability in the raw materials, production processes and the repeatability of the compliance test itself. Assurance of compliance is essential. Modest changes in the range of 1/100th to 2/100^{ths} of a part per million are

¹ CWIC submitted earlier comments dated April 11 addressing the language of the ATCM and other technical drafting issues. Background information on the economic impact, alternative resin and discussion of specific items in ISOR will be submitted separately.

absolutely essential in the Phase 2 ceiling levels. Even with those changes the ARB rule would be the most comprehensive, toughest formaldehyde control measure in the world.

Toughest Standard in the World

The proposal represents the toughest comprehensive standard in the world. It establishes a two-phase ceiling limit estimated to reduce emissions from hardwood plywood, particleboard and medium density fiberboard by 86%, 74%, and 81%, respectively.² Although one can find lower numbers in some international standards, they are not comparable for several reasons. California's limits are ceilings – they may not be exceeded. They are measured on the raw, unfinished panels regardless of the fact that the products may be covered or encapsulated with materials that prevent formaldehyde emissions from those panels. Unlike international standards that apply only in certain situations, but not others, the ATCM applies to all applications. The manufacturer cannot choose to certify a product to one level if it meets the standard and downgrade it to another acceptable standard if it does not. For instance, the Japanese standard has four different grades. The European E-1 standard has one level for raw board, another for materials that will be laminated. One must also be wary as to how other standards are measured. The E-1 standard allows averaging of results that can vary over the target by as much as 23% and over the limit by 10%. Japanese standards also have variances by as much as 33% to 40% (depending on grade) over stated levels to account for averaging and exceedances. The test used by CARB is a pass/fail ceiling limit with no exceedances or reclassification possible. There are very harsh penalties for non-compliance.

Industry's Proposals for Change in Ceiling Limits are Essential

CWIC carefully evaluated the manufacturing processes, available technology, needed product properties and the significant production variables in developing recommended levels for emission limits. It did not do so for purposes of posturing or negotiating, but rather it proposed the toughest levels that could be reasonably achieved in the future, given the structure of the CARB rule and reasonably available and feasible technology projected for the future. Although CWIC's proposals vary slightly from those proposed by CARB, those differences are essential and would still result in the toughest standard in the world:

² Table H-2. These numbers vary somewhat from the percentages found on page 5 of the Executive Summary. The reduction for hardwood plywood is significantly understated in the report because of errors in computation in Table H-1 (in determining emission rate the analysis divided L by N rather than the correct N by L) and use of inappropriate emission limit (0.3 ppm rather than 0.2 ppm for the particular type of hardwood plywood). The accurate reduction percentage is 77% for Phase 1 and 86% for Phase 2.

	Phase 1		Phase 2	
	<u>CARB</u>	<u>CWIC</u>	<u>CARB</u>	<u>CWIC</u>
Particleboard	0.18	0.18	0.09	0.10
MDF	0.21	0.21	0.11	0.13
Thin MDF	0.21	0.21	0.13	0.15
Hardwood Plywood				
Veneer core	0.08	0.08	0.05	0.06
Composite core	0.08	0.08	0.05	0.07

Although some of the Phase 2 numbers differ by only 0.01 ppm, the small number belies the underlying problems of moving to the CARB levels. Note at these low levels, 1/100th of a part per million is a significant 10% difference. At these extremely low levels, the requested increase has minimal impact on emissions, but significant impacts on production feasibility and cost.

Also note that the base test for showing compliance with the regulation, ASTM E-1333-96 (2002) has the following limitation as to repeatability: "Test results indicate a precision of within 0.03 ppm on the same samples." Section 13.1.1.

The changes in Phase 2 numbers are necessitated by the variability of emissions from the product as well as the lack of precision of the test method. For instance, to comply with the proposed Phase 2 limit for particleboard of 0.09 ppm, we estimate that production will have to be targeted in the 0.04 – 0.05 ppm level, or lower, to allow for the compounding variability of the test method and product. Staff originally opined that approximately a 0.02 ppm band below the ceiling would be sufficient for this purpose; their recent statements have suggested 0.03-0.04 would be required. Our estimates are based on extensive evaluation of the coefficient of variability observed over years of testing and statistical quality control analysis. With the draconian penalties in this rule for non-compliance, guessing and supposition are not possible. Manufacturers have to be sure that products comply. This mandates production targets well below the regulatory ceilings.

The 0.05 ppm level for particleboard represents a technological "tipping point," at or below which manufacturers would have to go to much different, non-urea formaldehyde based resin systems that would likely require different plant and equipment setups at substantial capital investment, present a totally different cost structure for the resins, slow production cycles, and increase energy costs and CO₂ emissions. CARB estimates a 30-40% cost increase from their Phase 2 proposal; based on extensive experience we believe it would be 50% to 60%. Some of these alternative systems simply wouldn't be technologically feasible in many industry facilities and thus would represent closure of capacity and constrained supply.

Numerous factors impact the variability. The process takes a mixture of raw wood fiber materials from a variety of sources, combines them with resins under a

range of climatic conditions, and produces panels using a wide variety of technologies to many, many customer specifications depending on the end use required.

With respect to hardwood plywood, many different species are used in a constantly changing product mix. A single press charge may include different cores, different face species and different thicknesses. The composition of the resin is the factor that can be best controlled – these compounds are mixed in reactors with good quality control on inputs. Downstream, however, the control is more difficult. For example, the furnish (fiber materials) that goes into the production of particleboard and MDF can vary greatly. In some plants, the source of fiber is relatively homogenous – saw dust or planer shavings from a single species is used. The resin absorption, physical geometry and density of the particles and fibers, and physical properties can be fairly narrowly defined. However, wood supply is a growing problem for the industry.

Our producers are increasingly having to use heterogeneous wood material from a variety of sources. Not only does the industry use wood shavings, saw dust and other residues from saw mills and other wood manufacturing facilities that would otherwise be burned, but increasingly it uses recycled material and even "urban wood." This material again would either be burned or, more likely, be sent to land fills. While this reflects the industry's notable achievements in using recycled materials, heterogeneous sources have greatly differing properties which impact emissions. This difference in raw wood materials cannot be overestimated. The homogeneity of the furnish, generally and particularly in the faces of the panels, directly impacts the emission profiles.

We have also discussed with you other important factors on variability. The equipment itself has inherent variabilities that influence emission properties of the panels. Normal operational control tolerances on temperature, out-of-press thickness, moisture, press times, etc. will always add uncertainty to the process.

The Economic Impact of the Rule is Enormous

Using ARB's unrealistically low numbers the cost of this rule in Phase 2 is \$127 per pound of formaldehyde removed (500 tons removed at a cost of \$127,000,000 annually); Phase 1 would be \$53 per pound (180 tons at a cost of \$19,000,000 annually). Compare this to the \$10-\$20 per pound cost of the diesel particulate rule or the \$2.60 cost-effectiveness of the recent perc rule. ARB's own statements about reasonable regulatory cost from other regulations highlight the extraordinary expense of this proposal ("... the cost-effectiveness of the proposed requirements [\$2.40 per pound] is similar to the cost effectiveness of other existing ARB regulatory programs." Proposed VOC limits for Consumer Products. "This [requirement] compares favorably to \$5 per pound, which is the typical cost-effectiveness value for an air pollution control measure." 1997 Proposal Regarding Exhaust Emissions and Air Conditioning Use.)

The fact is, however, that the costs presented in the ISOR are extraordinarily understated. Even if alternative resins existed in scale quantities, the economic impacts would be much higher than CARB estimates. CWIC has updated the analysis previously presented which uses the widely-accepted US Bureau of Economic Analysis' Regional Input-Output Modeling System (BEA RIMS II) model to capture the regional economic impacts to secondary manufacturers, wholesale and retail trade and transportation, and increased costs that consumers would likely pay for compliant particleboard and MDF panels. The model has ranges of assumptions about product substitution and increased costs. The national impact in the most likely scenario of the rule would be \$2.55 billion (\$536 million per year in California -- \$536/per pound). This analysis only covers particleboard and MDF. Data was not available for hardwood plywood, although CARB estimates that the ATCM would cause a 64% reduction in return on equity for California plants in this sector.

Why the significant difference from the \$127 Million estimated by CARB? Several reasons. First, this rule will have nationwide impact, not just costs to the California producers as assumed in the ISOR. Manufacturers of panels and finished products can't effectively maintain multiple inventories, particularly when their out-of-California customers, such as the furniture makers of North Carolina and Michigan, have to use compliant products. Second, the CARB estimates of cost increases for particleboard (30%) and for MDF (40%) are dramatically understated. We have used a minimum 50% increase based on the increased costs of resin systems and a 20% reduction in the throughput of the plants. CARB mentions production slowdown, but does not meaningfully quantify it in its computations. CARB also does not factor in increases in other parts of the distribution channel as the more expensive products are used. The ISOR equates manufacturing costs with prices and assumes that this static number applies through the channel. This ignores commercial reality.

By any measure this rule is extraordinarily expensive.

Enforcement of the Rule Will be Extremely Difficult

Industry has advocated for a very tough and exacting enforcement regimen to accompany the rule. Without effective enforcement, the unscrupulous would be in the position of avoiding the extraordinary costs of compliance and thereby realizing a significant competitive advantage. Compliance with this rule is not straightforward -- it is not like taking a can of paint to a lab to determine the VOC content. The E-1333 large chamber reference test takes several days to run with wet chemical analysis. Emissions vary over time. Measurement of compliance by finished products will be even more complicated and difficult. A large percentage of composite panels are covered with laminates, finishes and other barrier materials that prevent or inhibit emissions. The standard relates to "raw" panels before they are further fabricated, so the issue will be -- What is inside that piece of furniture or cabinet, and behind the paint or high pressure laminate? To check compliance, one will have to essentially destroy the piece of furniture -- to "deconstruct" it down to the panel itself. Determining non-compliance in

this setting is extremely difficult as deconstruction will likely alter the physical nature or the underlying panel. There is great uncertainty in this regard since the full enforcement program will not be available until after the regulation is promulgated.

Furniture imports have increased dramatically over the last decade. The ISOR notes an increase in Chinese exports of furniture from \$5 Billion in 1999 to \$22 Billion in 2005 – a large proportion coming to the United States. The percentage of containers that will be subject to inspection – let alone physical deconstruction of the contents – will necessarily be infinitesimal. The chance for mischief is too high to risk the severe impact on domestic manufacturers.

There is an inexplicable advantage for imported products that has been written into the regulation relating to the period of time that can be used to "sell-through" inventoried products after the effective date. Domestic manufacturers of panels are given a one-month grace period; importers a five-month transition time. Similarly, domestic fabricators are given twelve-months to sell inventory; importers are given eighteen months. If this bias for foreign goods remains, there will be a surge of imports that will overwhelm the market. For six months imported products will have one standard, American manufacturers another. Not only will the substantial price advantage be in place for the imported goods, but the surge will inevitably wreak havoc on the normal supply demand relationships and market structures. Whatever regulation is established, these periods must be equalized.

The Health Effects Presented do Not Reflect Current Science

Formaldehyde is one of the most widely studied compounds in the world. It has been seriously mischaracterized in the Initial Statement of Reasons for two principal reasons: (1) major new information adopted by US EPA, Health Canada, Germany and other jurisdictions has been ignored by CARB and OEHHA staff, and (2) high range "statistical bounds" of the OEHHA risk assessment have been deemed "cancer cases reduced" contrary to all professional guidance on the use of risk assessment numbers. The Formaldehyde Council, Inc. will submit detailed information on these topics.

It is undeniable that formaldehyde at very high exposure levels (above levels that could be tolerated by humans) results in cancers in laboratory animals. Since the 1992 OEHHA risk assessment, however, major strides have been made in understanding the mechanism of formaldehyde carcinogenicity – its interaction with cell material, its delivered dose to the cells, and the role of cytotoxicity in the process. These and other discoveries have led to new biologically-based risk assessments which show virtually no risk at the levels involved in residences. It has a virtual threshold. Much of the information was developed with the guidance and input of the Environmental Protection Agency and Health Canada. This information was submitted to CARB several years ago. CARB decided not to consider the new science in its rule-making, arguing that there was nothing new! The U.S. EPA and Health Canada disagree – they have used this new scientific information in rule makings. It has also been endorsed in Germany and other countries.

The staff report suggests that its regulation would result in a specific number of "reduced cancer cases." This is a total misuse of risk assessment numbers. The unit risk is based on an upper 95% confidence level expression of a computerized model. The 1992 Final Report identifying formaldehyde as a toxic Air contaminant noted; "These 95 percent upper confidence limits for excess lifetime risks are health-protective estimates; the actual risk may be significantly lower." It is widely accepted that statistical expressions are not appropriate for use as point estimates of risk.

These are ranging numbers of risk, the new risk assessments show virtually no risk of exposure to formaldehyde in the indoor environment even using a 95% upper confidence limit.

Conclusion

This rule will be an extremely tough and expensive endeavor. The industry has worked hard with the staff over the last five years to make it fair, enforceable and technically-based. In an effort to help CARB, industry has volunteered to lower emission levels 63% to their absolute lowest feasible levels on an industry-wide basis only to have CARB insist on setting limits below feasibility, even for a technology forcing regulation. The industry recommendation on Phase 2 limits when coupled with all of the other features of the rule would still make it the toughest in the world.

Much of the dispute now centers on 1/100th to 2/100th's of a part per million in the ceiling values being proposed. These increases are essential. If the staff is wrong about the variability of the processes at these micro-levels and the impact of a 0.03 ppm repeatability feature in the compliance test, many companies would cease to exist and the cost impact on the industry and the economy of California and the rest of the country would be unprecedented. If the industry's estimates of variability based on years of experience with coefficient of variability, statistical quality control, and production realities are wrong, CARB can always revisit the issue. The balance of equities -- the "tipping point" -- mandates the proposed increases.