

# Airborne Toxic Control Measure for Composite Wood Products



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**Air Resources Board**

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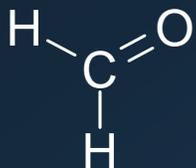


# California Health & Safety Code Requirements

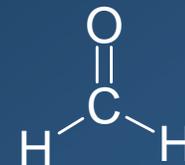
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- § 39657 - Requires ARB to identify toxic air contaminants; identify minimum threshold level if any
- § 39658 - Requires ARB to develop Airborne Toxic Control Measures (ATCMs)
- § 39660.5 - Requires ARB to assess California's indoor exposure to toxic air contaminants (TACs) and the relative contribution to total exposure
- § 39665 - Requires ARB to prepare a report on the need and appropriate degree of regulation
- § 39666 - For compounds with no threshold level, the HSC requires control measures to be based on best available control technology, or more effective controls in consideration of costs and risk

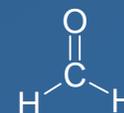




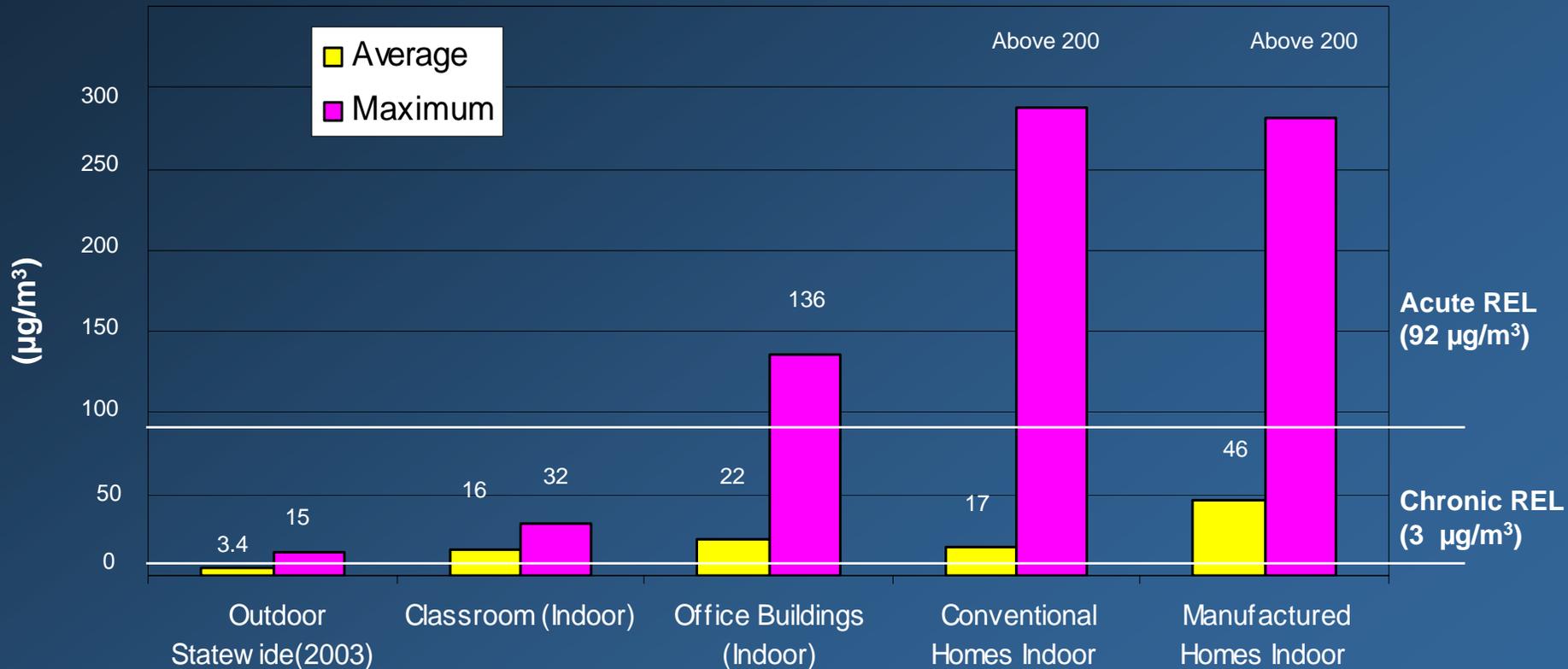
# Why is Formaldehyde a Concern?



- ARB Identified as TAC in 1992 with no safe threshold exposure level
  - nasopharyngeal cancer
  - acute and chronic effects- eye, nose, respiratory irritant
- SRP Identified as a Tier 2 compound under SB 25 evaluation
  - Children's Environmental Health Protection Act
- Formaldehyde is both an indoor and outdoor health risk
  - 4% of CA classrooms above OEHHA's interim 8-hr REL (27ppb)
  - 80% of ambient levels are photochemically derived
  - CA average concentration above OEHHA chronic REL (3 $\mu\text{g}/\text{m}^3$ )
  - Avg. ambient levels result in 18 excess cancers per million



# What are Typical Formaldehyde Levels?



70 years at 1 µg/m³ = 6 lifetime cancers per million



# Why is ARB Targeting Composite Wood Products?

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- Composite wood products made from urea-formaldehyde resin systems
- Formaldehyde emitted outdoors
  - truck/rail/ship transportation, lumberyards, new home construction/remodeling, through open windows and doors, and home ventilation systems
- Significant source of personal formaldehyde exposure
- Other CA sources being addressed by volatile organic compound controls
  - e.g. motor vehicles & consumer products



# Worldwide Standards for Wood-Based Panels



- United States
  - 1985 HUD standards; voluntary
  - New ASTM/ANSI specifications under review
- Europe
  - E1 standards for plywood and particleboard are about half of the HUD standards
- Japan (F\*\* - F\*\*\*\*)
  - F\*\*\* standard is stringent, technology-forcing for some products
  - F\*\*\*\* standard represents de minimis levels

# Proposed ATCM

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- Applies to particleboard, medium density fiberboard and hardwood plywood
  - Raw boards
  - Finished products
- Formaldehyde Performance Standards
  - Phase 1- Met by over 40% of US companies; level similar to E1 std.
  - Phase 2- Technology forcing; similar to Japan F\*\*\* stds.
- Applies to producers, fabricators, importers, retailers
- Enforcement
  - Manufacturers- 3<sup>rd</sup> party certification to ensure compliance
  - Chain-of-custody
  - Lab verification procedures

# Proposed ATCM Standards\*

	HUD Std.	Phase 1 (ppm)	Phase 2 (ppm)
		Effective Date 2008	Effective Date 2010-2012
Particleboard	<b>0.30</b>	<b>0.18</b>	<b>0.08</b>
Medium Density Fiberboard	<b>none</b>	<b>0.21</b>	<b>0.08</b>
Hardwood Plywood:			
-Veneer Core	<b>0.20</b>	<b>0.09</b>	<b>0.03</b>
-Composite Core	<b>None</b>	<b>TBD</b>	<b>TBD</b>

\* Based on ASTM E1333



# Commercial Panels Meeting Phase 2

	Company	Compwood Products	Resin System	Cost Relative to UF or PF Resins
Arreis	Sierra Pine	MDF	MDI	cost neutral
Medite II				+50%/board
Medex				
Resincore I	Rodman Industries	PB	PF	+20%/board
Purebond	Columbia Forest Products	HWPW	Soy-based	cost neutral
Multibond	States Industries	HWPW	PVA	+30%/board
Purekor	Collins Pine Company	HWPW, PB, MDF	MDI	+50%/board
Skyblend	Roseburg	PB	PF	+20%/board



# Commercial Resin Systems Meeting Phase 2

	Company	Applicability	Resin System	Est. Cost Relative to UF/PF
EcoBind resin system	Hexion	HWPW, PB, MDF	MUF + co-reactants, PF, soy/PVA blend	? New Product Line
Kenocatch resin system	Akzo Nobel	MDF, PB	MUF + catcher	+10%/board
Rubinate resin system	Huntsman	PB, MDF	polyurethane	+50%/board
Soyad resin system	Heartland Resource Technologies	HWPW	Soy + PF	~50% < PF



# Benefits of the Proposed ATCM

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- Reduce potential formaldehyde emissions
  - i.e.. effective pollution prevention
- Achieves reductions in indoor settings where people spend most time
- Reduces composite wood emissions by 30% in Phase 1 and 80% in Phase 2
- Reduces overall exposure by 15% (Phase 1) to 40% (Phase 2)
  - higher for new homes



# ATCM Impact on Panel Costs

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- Drop-in resin technologies available for Phase 1&2
- Adhesive is about 30% of particleboard & medium density fiberboard mfg. cost; 5% of hardwood plywood

	<u>Phase 1 Stds.</u>	<u>Phase 2 Stds.</u>
<b>Particleboard</b>	<50 cents/panel	~ \$2/panel
<b>MDF</b>	<50 cents/panel	~ \$3/panel
<b>HWPW</b>	~\$2/panel	~ \$4/panel



# ATCM Consumer Costs

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- **Typical kitchen cabinet remodel example**
  - Remodeling with Phase 2 compliant composite wood products is estimated to cost about \$90 more
- **Preliminary estimates show incremental consumer price for new house and furniture to be less than 1% and 5%, respectively**



# Next Steps

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Public Workshop	October 23, 2006
45-day Comment Period	December 8, 2006
Board Hearing	January 26, 2006



# For More Information:

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Visit our website-

<http://www.arb.ca.gov/toxics/compwood/compwood.htm>



Or, contact-

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