United States Environmental Protection Agency

Pressed Wood Manufacturing Industry Survey:

Hardwood Plywood, Medium Density Fiberboard, and Particleboard Manufacturers

Questionnaire

Survey ID: _____

Please return the completed response no later than **Weekday, Month Day, Year.**

Completing the survey is voluntary, but it is important that you respond. EPA needs information from all companies (including those making products with low formaldehyde emissions) to determine whether further action is needed, and to understand the impact of potential actions on manufacturers. Your participation will help EPA understand your company and the industry as a whole.

The information collected by EPA may be disclosed to contractors of the Agency. This access will only occur to enable the contractors to perform required tasks for the Agency. These contractors, including staff, will comply with Agency procedures for contractor handling of confidential information collected in connection with TSCA. By returning the survey to EPA, I consent to this disclosure to EPA's contractors.

The public reporting and recordkeeping burden for this collection of information is estimated to average 20 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed questionnaire to this address.

An Agency may not conduct or sponsor, and a person is not required to respond to, a collection of information, unless it displays a currently valid OMB control number.

I. General Manufacturer Identification Information

Please verify that the information that we have for your company is accurate. Please **correct any errors or complete any missing information** on the lines following Questions 1 through 8 below. Please consult appropriate staff at your company as necessary to obtain the correct information.

Check red box if response is confidential business information (CBI)

☐ **1. The name of your company:**

_____

☐ **2. The name of your plant:**

_____

☐ **3. The address of your plant (mailing address and physical address, if different):**

Physical
Address Line 1: _____

Address Line 2: _____

City: _____ State: ☐☐ ZIP ☐☐☐☐☐

Mailing
Address Line 1: _____

Address Line 2: _____

City: _____ State: ☐☐ ZIP ☐☐☐☐☐

☐ **4. The name and address of the ultimate parent company that owns this plant:**

Parent Company: _____

Address Line 1: _____

Address Line 2: _____

City: _____ State: ☐☐ ZIP ☐☐☐☐☐

☐ **5. Your company's website address:**

_____

☐ **6. Your contact information:**

Name: _____

Title: _____

Telephone: _____

E-mail: _____

Check red box if response is confidential business information (CBI)

7. Size of ultimate parent company:

☐ a. The approximate number of employees (worldwide) of the ultimate parent company that owns this plant:

Number:
- ☐ less than 50
- ☐ 50-99
- ☐ 100-249
- ☐ 250-499
- ☐ 500-999
- ☐ 1,000-1,499
- ☐ 1,500 or more

☐ b. The approximate 2009 gross revenue (worldwide) of the ultimate parent company that owns this plant:

Gross Revenue ($):
- ☐ less than $1 million
- ☐ $1-$49 million
- ☐ $50-$99 million
- ☐ $100-$499 million
- ☐ $500 million or more

8. Size of this plant:

☐ a. The approximate total number of employees (full time and part time) in total at this plant:

Number:
- ☐ less than 25
- ☐ 25-49
- ☐ 50-99
- ☐ 100-149
- ☐ 150-249
- ☐ 250-499
- ☐ 500 or more

☐ b. The approximate 2009 gross revenue of this plant:

Gross Revenue ($):
- ☐ less than $1 million
- ☐ $1-$49 million
- ☐ $50-$99 million
- ☐ $100-$499 million
- ☐ $500 million or more

II. Primary Pressed Wood Products Manufactured

9. Primary pressed wood products manufactured and production volume.

** Check red box if response is confidential business information (CBI)*

CBI*	Pressed Wood Category (Column 1)	Check if manufactured at your plant (Column 2)	In the 5-year period from 2005 through 2009, what was the average annual total production? (please specify basis) (Column 3)	Provide your plant's rated maximum capacity (Column 4)
	Example: ***c. Particleboard***	☒	***Avg. annual production:*** ***1 million sq. ft*** ***basis: 3/4"***	***Max capacity:*** ***5 million sq. ft*** ***basis: 3/4"***
☐	a. Hardwood Plywood	☐	Avg. annual production: basis:	Max capacity: basis:
☐	b. Medium Density Fiberboard (MDF)	☐	Avg. annual production: basis:	Max capacity: basis:
☐	c. Particleboard	☐	Avg. annual production: basis:	Max capacity: basis:

10. Regions where pressed wood products manufactured at your plant were sold and are expected to be sold. PLEASE CHECK ALL THAT APPLY (check N/A if not applicable).

** Check red box if response is confidential business information (CBI)*

CBI*	Pressed Wood Category (Column 1)	Regions where primary pressed wood products were sold during the five year period from 2005 through 2009 (Column 2)	Regions where primary pressed wood products are expected to be sold after the end of 2012 (Column 3)
☐	a. Hardwood Plywood	☐ California ☐ U.S. (excluding CA) ☐ European Union ☐ Japan ☐ Other Nations ☐ N/A or I don't know	☐ California ☐ U.S. (excluding CA) ☐ European Union ☐ Japan ☐ Other Nations ☐ N/A or I don't know
☐	b. Medium Density Fiberboard	☐ California ☐ U.S. (excluding CA) ☐ European Union ☐ Japan ☐ Other Nations ☐ N/A or I don't know	☐ California ☐ U.S. (excluding CA) ☐ European Union ☐ Japan ☐ Other Nations ☐ N/A or I don't know
☐	c. Particleboard	☐ California ☐ U.S. (excluding CA) ☐ European Union ☐ Japan ☐ Other Nations ☐ N/A or I don't know	☐ California ☐ U.S. (excluding CA) ☐ European Union ☐ Japan ☐ Other Nations ☐ N/A or I don't know

Check red box if response is confidential business information (CBI)

11. ☐ Hardwood plywood is produced at this plant.
If hardwood plywood is NOT produced at this plant please skip to Question 12.

☐ a. Please indicate the type(s) of hardwood plywood production process(es) used at your plant:

- ☐ Log-based mill (interior veneer plys generated on-site from logs, face veneers and interior composite panels may be purchased)
- ☐ Purchases all veneers and/or composite panel components (no log processing capability)
- ☐ Purchases prepared platforms and face veneers (3-ply mill)
- ☐ Engineered flooring
- ☐ Flushed door
- ☐ None of the above. Please specify the type:

☐ b. Indicate which process you use for manufacturing hardwood plywood:

- ☐ All hardwood plywood is produced using a line-by-line process
- ☐ All hardwood plywood is produced using a 2-step process
- ☐ Hardwood plywood is produced using both line-by-line and 2-step processes. Please indicate the share of hardwood plywood production volume that is line-by-line: _____ %
- ☐ None of the above. Please specify the process:

☐ c. Indicate the type(s) of platforms you use for manufacturing hardwood plywood:

- ☐ Veneer core
- ☐ Particleboard core
- ☐ Medium density fiberboard core
- ☐ Lumber core
- ☐ Combination core
- ☐ None of the above. Please specify the type:

☐ d. Indicate whether any hardwood plywood produced at this plant does not meet CARB's definition of hardwood plywood:

- ☐ No
- ☐ Yes, military specified hardwood plywood
- ☐ Yes, curved hardwood plywood
- ☐ Yes, hardwood plywood defined as a laminated product under CARB

Check red box if response is confidential business information (CBI)

12. ☐ Medium density fiberboard is produced at this plant.
If medium density fiberboard is NOT produced at your plant please skip to Question 13.

☐ a. Please indicate how much thin board (<3/8") your plant produces as a share of all medium density fiberboard production volume at your plant: _____ %

☐ b. Please describe the typical pH levels of your raw wood material:

- ☐ Raw wood material has relatively high pH levels (6.0 or greater)
- ☐ Raw wood material has average pH levels (4.0 to 5.9)
- ☐ Raw wood material has relatively low pH levels (3.9 or less)

☐ c. Does your plant manufacture layered medium density fiberboard?

- ☐ Yes
- ☐ No

☐ d. Please specify the type of blending equipment your plant employs:

- ☐ Blowline blending exclusively
- ☐ Mechanical blending exclusively
- ☐ Combination of blowline and mechanical blending
- ☐ None of the above. Please specify the type:

☐ e. Please indicate the type(s) of press(es) at your plant:

- ☐ Multi-opening platen press(es)
- ☐ Single opening platen press(es)
- ☐ Steam injection platen press(es)
- ☐ Continuous steel belt press(es)
- ☐ Continuous drum (Mende) press(es)
- ☐ None of the above. Please specify the type:

☐ f. Please indicate how important your board's appearance is to your customers:

- ☐ Appearance is very important
- ☐ Appearance is somewhat important
- ☐ Appearance is not important

Check red box if response is confidential business information (CBI)

13. ☐ **Particleboard is produced at this plant.**
If particleboard is NOT produced at your plant please skip to Question 14.

☐ a. Please indicate how much thin board (<1/2") your plant produces as a share of all particleboard production volume at your plant: _____ %

☐ b. Please describe the typical pH levels of your raw wood material:

- ☐ Raw wood material has relatively high pH levels (6.0 or greater)
- ☐ Raw wood material has average pH levels (4.0 to 5.9)
- ☐ Raw wood material has relatively low pH levels (3.9 or less)

☐ c. Please indicate the approximate percentages of your particleboard production by grade (see ANSI 208.1-2009 for grade definitions)

_____% Grade H-1 (High density industrial)
_____% Grade H-2 (High density industrial)
_____% Grade H-3 (High density industrial)
_____% Grade M-0 (Commercial)
_____% Grade M-1(Commercial)
_____% Grade M-S (Commercial)
_____% Grade M-2 (Industrial)
_____% Grade M-3i (Industrial)
_____% Grade M-3 (Interior stair tread)
_____% Floor Underlayment (PBU)
_____% MFD Home Decking (D-2, D-3)
_____% Door Core (LD-1, LD-2)
_____% Other Please specify: _____

☐ d. Please indicate the type(s) of press(es) at your plant:

- ☐ Multi-opening platen press(es)
- ☐ Single opening platen press(es)
- ☐ Steam injection platen press(es)
- ☐ Continuous steel belt press(es)
- ☐ Continuous drum (Mende) press(es)
- ☐ None of the above. Please specify the type:

☐ e. Please describe the type(s) of forming line(s) your plant employs:

- ☐ Caul
- ☐ Caul-less

☐ f. Please indicate how important your board's appearance is to your customers:

- ☐ Appearance is very important
- ☐ Appearance is somewhat important
- ☐ Appearance is not important

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14. Resin Types and Certification Standards. Please complete the following table for particleboard, medium density fiberboard, and hardwood plywood products produced at your plant. If you produce products in more than one adhesive/emissions class, list each class in a separate row. For the purpose of this survey, adhesive/emissions class means a class of pressed wood product that differs from others based on binder/resin technology, formaldehyde emission certification standard category, and/or formaldehyde emission profile. If you use more than one resin type for the same product, such as different resins for face and core layers, please indicate each resin in the table (see example below).

If you need more rows than provided in the table below, click the button below to have the electronic version of this form automatically generate an additional copy of this question. If you are using the paper version of this form, please use the extra copies provided and make additional copies as necessary.

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** Check red box if response is confidential business information (CBI)*

CBI*	Pressed Wood Category (select from list below)[1] (Column 1)	Adhesive/ Emissions Class (Column 2)	Binder/ Resin Category (select from list below)[2]			Formaldehyde Emission Certification Standard Category (select from list below)[3]		
			Previous (if changed in last 5 years) (Column 3)	Current (Column 4)	Planned changes (over the next 3 years) (Column 5)	Previous (if changed in last 5 years) (Column 6)	Current (Column 7)	Planned changes (over the next 3 years) (Column 8)
	Example: MDF	1	Face: UF Core: UF	Face: MUF Core: UF	Face: MUF+s Core: UF+s	None	CA-1	CA-2
	Example: MDF	2	Not Applicable	UF+s	MUF+s	None	CA-1	CA-2
☐								
☐								
☐								
☐								

1. Pressed Wood Category Abbreviations:

HWPW	Hardwood Plywood
MDF	Medium Density Fiberboard
PB	Particleboard

2. Binder/Resin Categories:

CNSL	Cashew Nut Shell Liquid	**PVA**	Polyvinyl Acetate
MF	Melamine-formaldehyde	**SBR**	Soy-based resins
MUF	Melamine-urea-formaldehyde	**TBR**	Tannin-based resins
pMDI	Polymeric Diphenylmethane Diisocyanate	**UF**	Urea-formaldehyde
		O	Other: Please Describe
PF	Phenol-formaldehyde		
PF-MDI	Phenol-formaldehyde-MDI	**+s**	addition of scavenger to resin (for example, "MF+s")
PMUF-MDI	Phenol-melamine-urea-formaldehyde-MDI	**+c**	addition of catalysts to resin
PUF-MDI	Phenol-urea-formaldehyde-MDI	**+a**	addition of other additives to resin
PUFT	Phenol-urea-formaldehyde Tannin		

3. Certification Standard Categories:

CA-1	CARB Phase 1
CA-2	CARB Phase 2 (not ULEF or NAF)
CA-2(ULEF)	CARB Phase 2 with ultra-low-emitting formaldehyde
CA-2(NAF)	CARB Phase 2 with no added formaldehyde
CPA	CPA EPP Grademark
E1/E2	European Standard (specify level in table above)
F	Japanese Standard (specify "*" level in table above)
HUD	HUD Standard
O	Other - please specify
None	No certification standard category was met/will be met
N/A	Not applicable/not required

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15. Formaldehyde Emission Levels from Finished Boards. Please complete the following table for particleboard, medium density fiberboard, and hardwood plywood products produced at your plant. For the purpose of this survey, adhesive/emissions class means a class of pressed wood product that differs from others based on binder/resin technology, formaldehyde emission certification standard category, and/or formaldehyde emission profile. If you produce products in more than one adhesive/emissions class, list each class in a separate row.

For average and maximum emissions, provide results from a standard test method for a large or small chamber test (see Figure 4 of instructions). Provide results as large chamber equivalent emissions if possible. If you have been making the current adhesive/emissions class for a year or more, calculate the average and maximum emissions over a one year period. If you have not been making the product for a full year, calculate the average and maximum over whatever time frame you manufactured the adhesive/emissions class.

If you are using the paper version of the form, please use the extra copies provided and make additional copies as necessary, and list the pressed wood categories and adhesive/emissions classes in the order that you reported them in Column 1 and Column 2 of Question 14.

Will you report all the formaldehyde emissions below as large chamber equivalent emissions? ☐ Yes ☐ No
If No, please specify which rows do not report large chamber equivalent emissions and indicate the measurement method used:

_____

** Check red box if response is confidential business information (CBI)*

CBI*	Pressed Wood Category (select from list below)[1] (Column 1)	Adhesive/ Emissions Class (Column 2)	Formaldehyde emission levels from finished boards						Share of Production Volume	
			Previous (if changed in last 5 years)		Current		Planned (over the next 3 years)			
			Average (specify units) (Column 3)	Max (specify units) (Column 4)	Average (specify units) (Column 5)	Max (specify units) (Column 6)	Average (specify units) (Column 7)	Max (specify units) (Column 8)	Current (%) (Column 9)	Planned (%) (Column 10)
	Example: MDF	1	unknown	unknown	0.10 ppm	0.15 ppm	0.06 ppm	0.08 ppm	40%	20%
	Example: MDF	2	Not Applicable	Not Applicable	0.15 ppm	0.18 ppm	0.06 ppm	0.09 ppm	60%	80%
☐										
☐										
☐										
☐										

1. Pressed Wood Category Abbreviations:

HWPW Hardwood Plywood
MDF Medium Density Fiberboard
PB Particleboard

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III. Changes to Achieve CARB Phase 1 Certification

Please complete Questions 16 through 18 if you have made changes to your production process or raw materials for the purpose of achieving CARB Phase 1 certification.

Please consider only the most recent major reduction in formaldehyde emissions you have made specifically to comply with CARB Phase 1 in your responses to Questions 16-18.

For example, if you are a particleboard manufacturer who:

1. Made changes to your adhesive system to meet the CPA EPP Grademark formaldehyde emission limit of 0.30 ppm,
2. Then made additional changes to meet the revised CPA EPP Grademark formaldehyde emission limit of 0.20 ppm,
3. Then made additional changes to meet the CARB Phase 1 formaldehyde emission limit of 0.18 ppm,

Your responses should only reflect the changes you made to reduce your formaldehyde emissions from the 0.20 ppm limit to the 0.18 ppm limit to achieve CARB Phase 1 certification. If you made multiple changes to reduce your formaldehyde emissions from the 0.20 ppm to 0.18 ppm, report the sum of all of those changes.

A separate copy of Section III needs to be completed for *each pressed wood category* where there were changes to achieve CARB Phase 1 certification. In addition, if you have made changes to more than one adhesive/emissions class within a pressed wood category, please complete a separate copy of Section III for *each adhesive/emissions class*. Adhesive/emissions class means a class of pressed wood products that differs from others based on binder/resin technology, formaldehyde emission certification standard category, and/or formaldehyde emission profile.

Click the button below to have the electronic version of this form automatically generate an additional copy of Section III. If you are using the paper version of this form, please use the extra copies provided and make additional copies as necessary.

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Check red box if response is confidential business information (CBI)

16. Changes to the production processes or raw materials to achieve CARB Phase 1 certification.
Check all boxes that apply and fill in the applicable blanks.

☐ a. Specify product for which there were changes to the production processes or raw materials used in order to achieve CARB Phase 1 certification:

Primary Pressed Wood Category: _____

Adhesive/Emissions Class: _____

Check red box if response is confidential business information (CBI)

16. (cont.) Changes to the production processes or raw materials to achieve CARB Phase 1 certification.
Check all boxes that apply and fill in the applicable blanks.

b. What were the changes to the resin system or production process? Please check all that apply.

- ☐ Lower ratio of formaldehyde to other resin component(s) (e.g., urea, melamine, phenol, etc.).
  Please specify non-formaldehyde resin component: _____
- ☐ Addition of or changes to catalysts in resins
- ☐ Addition of or changes to scavengers in resins
- ☐ Addition of or changes to other additives in resins
- ☐ Post-press treatment of panels
- ☐ New resin system (for example, substituting melamine for urea)
- ☐ Changes to application equipment
- ☐ Changes to blending equipment
- ☐ Changes to process controls
- ☐ Changes to pressing or drying times
- ☐ Changes to pressing or drying temperatures
- ☐ Other Please specify: _____

c. Please indicate the extent to which you have optimized your production process since making these changes:

- ☐ Production Process Fully Optimized
- ☐ Production Process Nearly Optimized
- ☐ Production Process Partially Optimized
- ☐ Production Process Not Optimized

d. Do you expect to incur additional costs associated with optimizing your process?

- ☐ Yes: Please provide an estimate of the additional costs you expect to incur for process optimization: $ _____ or choose a range: ☐
- ☐ No

e. OPTIONAL. Please use the space below to clarify or further explain any of your responses to Question 16.

17. Issues your plant addressed in order to achieve CARB Phase 1 certification.

a. ☐ Your plant needed to address issues associated with sticking or buildup on press platens.

b. ☐ Your plant needed to improve resin unloading, storage and handling system to deal with higher liquid viscosity, handle dry materials, and/or blend multiple components.

Check red box if response is confidential business information (CBI)

17. (cont.) Issues your plant addressed in order to achieve CARB Phase 1 certification.

c. ☐ Your plant needed to upgrade blending or application equipment.

Please describe equipment change. For instance, "*Installed two new metering pumps and flow meters to control ratios of resin components to a new inline mixer. Installed new programmable automation controllers on the blender and resin metering pumps and integrated into the mill's visualization platform.*"

d. ☐ Your plant needed to address issues associated with resin tack, including:

- ☐ Build-up in conveyers, bins, or mat formers
- ☐ Mat integrity problems
- ☐ Prepress tack

e. ☐ Your plant needed to upgrade your press.

For the press that was upgraded, please describe what was done. For instance, "*Converted the press from steam heat to thermal oil in order to achieve higher platen temperature and improve productivity with PF resin.*"

f. ☐ Your plant needed to resolve issues associated with not having enough cooling capacity to deal with master panels.

g. ☐ Your plant needed to resolve issues associated with out-of-press moisture content due to longer or hotter press times.

h. ☐ Industrial hygiene concerns (e.g., worker health) influenced your ability to use certain resin types.

i. ☐ Your plant needed to resolve issues associated with waste control.

Please explain:

j. ☐ Your plant needed to address issues associated with limited excess drying capacity.

k. ☐ Your plant needed to modify your board coolers.

l. ☐ Your plant needed to add new wood burners to burn residuals that were previously recycled.

Check red box if response is confidential business information (CBI)

17. (cont.) Issues your plant addressed in order to achieve CARB Phase 1 certification.

☐ m. OPTIONAL. Please use the space below to describe other issues your plant addressed or to clarify or further explain any of your responses to Question 17.

18. Estimated costs of changes to the production processes or raw materials.

☐ a. Did your plant incur research and development costs directly as a result of changes made to achieve CARB Phase 1 certification?

- ☐ Yes: Please provide cost estimate: $ _____ or choose range: ☐
- ☐ No

☐ b. Did your plant incur capital improvement costs directly as a result of changes made to achieve CARB Phase 1 certification (check all that apply)?

- ☐ Yes, capital expenditures for modifying existing equipment
- ☐ Yes, capital expenditures for new equipment
- ☐ No

Please provide a cost estimate for all capital improvements costs directly related to changes made to achieve CARB Phase 1 certification:

Enter estimate: $ _____ or choose a range: ☐

☐ c. Did your plant incur any other start-up or one-time costs directly as a result of changes made to achieve CARB Phase 1 certification?

- ☐ Yes: Please provide cost estimate: $ _____ or choose range: ☐
- ☐ No

Please describe the costs incurred:

Check red box if response is confidential business information (CBI)

18. (cont.) Estimated costs of changes to the production processes or raw materials.

☐ d. Did any of the following material costs change directly as a result of changes made to achieve CARB Phase 1 certification (check appropriate boxes)?

Resin prices:	☐ increased	☐ decreased	☐ remained unchanged
Resin usage:	☐ increased	☐ decreased	☐ remained unchanged
Additive costs:	☐ increased	☐ decreased	☐ remained unchanged
Post-press treatment costs:	☐ increased	☐ decreased	☐ remained unchanged
Other material costs:	☐ increased	☐ decreased	☐ remained unchanged

please specify: _____

Please provide an estimate of how much material costs changed directly as a result of changes made to achieve CARB Phase 1 certification per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

Overall, this was a cost: ☐ increase ☐ decrease

☐ e. Did any of the following operating costs change directly as a result of changes made to achieve CARB Phase 1 certification (check appropriate boxes)?

Labor costs:	☐ increased	☐ decreased	☐ remained unchanged
Energy costs:	☐ increased	☐ decreased	☐ remained unchanged
Other operating costs:	☐ increased	☐ decreased	☐ remained unchanged

please specify: _____

Please provide an estimate of how much operating costs changed directly as a result of changes made to achieve CARB Phase 1 certification per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

Overall, this was a cost: ☐ increase ☐ decrease

☐ f. Did any of the following recordkeeping, testing, or certification costs change as a result of changes made to achieve CARB Phase 1 certification (check appropriate boxes)?

Recordkeeping costs:	☐ increased	☐ decreased	☐ remained unchanged
Testing and certification costs:	☐ increased	☐ decreased	☐ remained unchanged

Please provide an estimate of how much recordkeeping, testing, and certification costs changed as a result of changes made to achieve CARB Phase 1 certification:

Enter estimate for initial costs: $ _____ or choose a range: ☐

Enter estimate for annual recurring costs: $ _____ or choose a range: ☐

Overall, this was a cost: ☐ increase ☐ decrease

Check red box if response is confidential business information (CBI)

18. (cont.) Estimated costs of changes to the production processes or raw materials.

☐ g. Did product reject rates change directly as a result of changes made to achieve CARB Phase 1 certification? If so, how much did the reject rate increase or decrease? *(Please indicate change in reject rate, not the overall rate)*

☐ Yes, higher - reject rate increased: ☐ less than 5% ☐ 5% to 10% ☐ more than 10%

☐ Yes, lower - reject rate decreased: ☐ less than 5% ☐ 5% to 10% ☐ more than 10%

☐ No, reject rates did not change as a result of changes made to achieve CARB Phase 1 certification.

Please provide an estimate of how much your costs changed directly as a result of the change in reject rate per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

☐ h. Please indicate the percentage of production that is rejected for exceeding the Phase 1 emission levels: _____ %

Please indicate what is done with panels rejected for exceeding the Phase 1 emission levels:

____% Sold for domestic use outside of California

____% Exported

____% Burned for energy generation

____% Reused as raw material

____% Used or disposed of in some other way. Please describe: ☐

☐ i. Did your plant experience an initial period of adjustment, where efficiency was low, as you made changes to achieve CARB Phase 1 certification? For example, this may include test production runs.

☐ Yes, adjustment period was experienced please specify approximate duration: _____

☐ No, no significant adjustment period was experienced

Please provide an estimate of how much your costs changed directly as a result of the initial adjustment period per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

☐ j. Did your plant's productivity, in terms of production per hour, change directly as a result of changes made to achieve CARB Phase 1 certification (check all that apply)?

☐ Yes, productivity increased please specify approximate percentage change: _____

☐ Yes, productivity decreased please specify approximate percentage change: _____

☐ No, productivity did not change as a result of changes made to achieve CARB Phase 1 certification.

Please provide an estimate of how much your costs changed directly as a result of the change in productivity per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

Check red box if response is confidential business information (CBI)

18. (cont.) Estimated costs of changes to the production processes or raw materials.

☐ k. Did your plant's amount of downtime (i.e., periods of time during which production was stopped) change directly as a result of achieving CARB Phase 1 certification?

- ☐ Yes, downtime increased — please specify how much downtime changed: _____
- ☐ Yes, downtime decreased — please specify how much downtime changed: _____
- ☐ No, downtime did not change as a result of changes made to achieve CARB Phase 1 certification.

Please provide an estimate of how much your costs changed directly as a result of the change in downtime: per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

☐ l. Did your plant incur any other recurring costs directly as a result of changes made to achieve CARB Phase 1 certification (check all that apply)?

- ☐ Yes: Please provide cost estimate: $ _____ or provide range: _____
  per thousand square feet of production on a _____ basis.
- ☐ No

Please describe the costs incurred:

☐ m. OPTIONAL. Please use the space below to clarify or further explain any of your responses to Question 18.

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IV. Changes to Achieve CARB Phase 2 Certification

Please complete Questions 19 through 21 if you have made changes to your production process or raw materials for the purpose of achieving CARB Phase 2 certification.

Please consider only the most recent major reduction in formaldehyde emissions you have made specifically to comply with CARB Phase 2 in your responses to Questions 19-21.

For example, if you are a particleboard manufacturer who:

1. Made changes to your adhesive system to meet the CPA EPP Grademark formaldehyde emission limit of 0.30 ppm,
2. Then made additional changes to meet the revised CPA EPP Grademark formaldehyde emission limit of 0.20 ppm,
3. Then made additional changes to meet the CARB Phase 1 formaldehyde emission limit of 0.18 ppm,
4. Then made additional changes to meet the CARB Phase 2 formaldehyde emission limit of 0.09 ppm,

Your responses should only reflect the changes you made to reduce your formaldehyde emissions from the 0.18 ppm limit to the 0.09 ppm limit to achieve CARB Phase 2 certification. If you made multiple changes to reduce your formaldehyde emissions from the 0.18 ppm to 0.09 ppm, report the sum of all of those changes.

A separate copy of Section IV needs to be completed for *each pressed wood category* where there were changes to achieve CARB Phase 2 certification. In addition, if you have made changes to more than one adhesive/emissions class within a pressed wood category, please complete a separate copy of Section IV for *each adhesive/emissions class*. Adhesive/emissions class means a class of pressed wood products that differs from others based on binder/resin technology, formaldehyde emission certification standard category, and/or formaldehyde emission profile.

Click the button below to have the electronic version of this form automatically generate an additional copy of Section IV. If you are using the paper version of this form, please use the extra copies provided and make additional copies as necessary.

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19. Changes to the production processes or raw materials to achieve CARB Phase 2 certification.
Check all boxes that apply and fill in the applicable blanks.

☐ a. Specify product for which there were changes to the production processes or raw materials used in order to achieve CARB Phase 2 certification:

Primary Pressed Wood Category: _____

Adhesive/Emissions Class: _____

Check red box if response is confidential business information (CBI)

19. (cont.) Changes to the production processes or raw materials to achieve CARB Phase 2 certification.
Check all boxes that apply and fill in the applicable blanks.

b. What were the changes to the resin system or production process? Please check all that apply.

- ☐ Lower ratio of formaldehyde to other resin component(s) (e.g., urea, melamine, phenol, etc.).
  Please specify non-formaldehyde resin component: _____
- ☐ Addition of or changes to catalysts in resins
- ☐ Addition of or changes to scavengers in resins
- ☐ Addition of or changes to other additives in resins
- ☐ Post-press treatment of panels
- ☐ New resin system (for example, substituting melamine for urea)
- ☐ Changes to application equipment
- ☐ Changes to blending equipment
- ☐ Changes to process controls
- ☐ Changes to pressing or drying times
- ☐ Changes to pressing or drying temperatures
- ☐ Other Please specify: _____

c. Please indicate the extent to which you have optimized your production process since making these changes:

- ☐ Production Process Fully Optimized
- ☐ Production Process Nearly Optimized
- ☐ Production Process Partially Optimized
- ☐ Production Process Not Optimized

d. Do you expect to incur additional costs associated with optimizing your process?

- ☐ Yes: Please provide an estimate of the additional costs you expect to incur for process optimization: $ _____ or choose a range: ☐
- ☐ No

e. OPTIONAL. Please use the space below to clarify or further explain any of your responses to Question 19.

20. Issues your plant addressed in order to achieve CARB Phase 2 certification.

a. ☐ Your plant needed to address issues associated with sticking or buildup on press platens.

b. ☐ Your plant needed to improve resin unloading, storage and handling system to deal with higher liquid viscosity, handle dry materials, and/or blend multiple components.

Check red box if response is confidential business information (CBI)

20. (cont.) Issues your plant addressed in order to achieve CARB Phase 2 certification.

☐ c. ☐ Your plant needed to upgrade blending or application equipment.

Please describe equipment change. For instance, "*Installed two new metering pumps and flow meters to control ratios of resin components to a new inline mixer. Installed new programmable automation controllers on the blender and resin metering pumps and integrated into the mill's visualization platform.*"

☐ d. ☐ Your plant needed to address issues associated with resin tack, including:

- ☐ Build-up in conveyers, bins, or mat formers
- ☐ Mat integrity problems
- ☐ Prepress tack

☐ e. ☐ Your plant needed to upgrade your press.

For the press that was upgraded, please describe what was done. For instance, "*Converted the press from steam heat to thermal oil in order to achieve higher platen temperature and improve productivity with PF resin.*"

_____

☐ f. ☐ Your plant needed to resolve issues associated with not having enough cooling capacity to deal with master panels.

☐ g. ☐ Your plant needed to resolve issues associated with out-of-press moisture content due to longer or hotter press times.

☐ h. ☐ Industrial hygiene concerns (e.g., worker health) influenced your ability to use certain resin types.

☐ i. ☐ Your plant needed to resolve issues associated with waste control.

Please explain:

☐ j. ☐ Your plant needed to address issues associated with limited excess drying capacity.

☐ k. ☐ Your plant needed to modify your board coolers.

☐ l. ☐ Your plant needed to add new wood burners to burn residuals that were previously recycled.

20. (cont.) Issues your plant addressed in order to achieve CARB Phase 2 certification.

☐ m. OPTIONAL. Please use the space below to describe other issues your plant addressed or to clarify or further explain any of your responses to Question 20.

21. Estimated costs of changes to the production processes or raw materials.

☐ a. Did your plant incur research and development costs directly as a result of changes made to achieve CARB Phase 2 certification?

- ☐ Yes: Please provide cost estimate: $ _____ or choose range: ☐
- ☐ No

☐ b. Did your plant incur capital improvement costs directly as a result of changes made to achieve CARB Phase 2 certification (check all that apply)?

- ☐ Yes, capital expenditures for modifying existing equipment
- ☐ Yes, capital expenditures for new equipment
- ☐ No

Please provide a cost estimate for all capital improvements costs directly related to changes made to achieve CARB Phase 2 certification:

Enter estimate: $ _____ or choose a range: ☐

☐ c. Did your plant incur any other start-up or one-time costs directly as a result of changes made to achieve CARB Phase 2 certification?

- ☐ Yes: Please provide cost estimate: $ _____ or choose range: ☐
- ☐ No

Please describe the costs incurred:

Check red box if response is confidential business information (CBI)

21. (cont.) Estimated costs of changes to the production processes or raw materials.

☐ d. Did any of the following material costs change directly as a result of changes made to achieve CARB Phase 2 certification (check appropriate boxes)?

Resin prices:	☐ increased	☐ decreased	☐ remained unchanged
Resin usage:	☐ increased	☐ decreased	☐ remained unchanged
Additive costs:	☐ increased	☐ decreased	☐ remained unchanged
Post-press treatment costs:	☐ increased	☐ decreased	☐ remained unchanged
Other material costs:	☐ increased	☐ decreased	☐ remained unchanged

please specify: _____

Please provide an estimate of how much material costs changed directly as a result of changes made to achieve CARB Phase 2 certification per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

Overall, this was a cost: ☐ increase ☐ decrease

☐ e. Did any of the following operating costs change directly as a result of changes made to achieve CARB Phase 2 certification (check appropriate boxes)?

Labor costs:	☐ increased	☐ decreased	☐ remained unchanged
Energy costs:	☐ increased	☐ decreased	☐ remained unchanged
Other operating costs:	☐ increased	☐ decreased	☐ remained unchanged

please specify: _____

Please provide an estimate of how much operating costs changed directly as a result of changes made to achieve CARB Phase 2 certification per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

Overall, this was a cost: ☐ increase ☐ decrease

☐ f. Did any of the following recordkeeping, testing, or certification costs change as a result of changes made to achieve CARB Phase 2 certification (check appropriate boxes)?

Recordkeeping costs:	☐ increased	☐ decreased	☐ remained unchanged
Testing and certification costs:	☐ increased	☐ decreased	☐ remained unchanged

Please provide an estimate of how much recordkeeping, testing, and certification costs changed as a result of changes made to achieve CARB Phase 2 certification:

Enter estimate for initial costs: $ _____ or choose a range: ☐

Enter estimate for annual recurring costs: $ _____ or choose a range: ☐

Overall, this was a cost: ☐ increase ☐ decrease

Check red box if response is confidential business information (CBI)

21. (cont.) Estimated costs of changes to the production processes or raw materials.

☐ g. Did product reject rates change directly as a result of changes made to achieve CARB Phase 2 certification? If so, how much did the reject rate increase or decrease? *(Please indicate change in reject rate, not the overall rate)*

☐ Yes, higher - reject rate increased: ☐ less than 5% ☐ 5% to 10% ☐ more than 10%

☐ Yes, lower - reject rate decreased: ☐ less than 5% ☐ 5% to 10% ☐ more than 10%

☐ No, reject rates did not change as a result of changes made to achieve CARB Phase 1 certification.

Please provide an estimate of how much your costs changed directly as a result of the change in reject rate per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

☐ h. Please indicate the percentage of production that is rejected for exceeding the Phase 2 emission levels: _____ %

Please indicate what is done with panels rejected for exceeding the Phase 2 emission levels:

____% Sold for domestic use

____% Exported

____% Burned for energy generation

____% Reused as raw material

____% Used or disposed of in some other way. Please describe: ☐

☐ i. Did your plant experience an initial period of adjustment, where efficiency was low, as you made changes to achieve CARB Phase 2 certification? For example, this may include test production runs.

☐ Yes, adjustment period was experienced please specify approximate duration: _____

☐ No, no significant adjustment period was experienced

Please provide an estimate of how much your costs changed directly as a result of the initial adjustment period per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

☐ j. Did your plant's productivity, in terms of production per hour, change directly as a result of changes made to achieve CARB Phase 2 certification (check all that apply)?

☐ Yes, productivity increased please specify approximate percentage change: _____

☐ Yes, productivity decreased please specify approximate percentage change: _____

☐ No, productivity did not change as a result of changes made to achieve CARB Phase 2 certification.

Please provide an estimate of how much your costs changed directly as a result of the change in productivity per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

Check red box if response is confidential business information (CBI)

21. (cont.) Estimated costs of changes to the production processes or raw materials.

☐ k. Did your plant's amount of downtime (i.e., periods of time during which production was stopped) change directly as a result of achieving CARB Phase 2 certification?

- ☐ Yes, downtime increased — please specify how much downtime changed: _____
- ☐ Yes, downtime decreased — please specify how much downtime changed: _____
- ☐ No, downtime did not change as a result of changes made to achieve CARB Phase 2 certification.

Please provide an estimate of how much your costs changed directly as a result of the change in downtime: per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

☐ l. Did your plant incur any other recurring costs directly as a result of changes made to achieve CARB Phase 2 certification (check all that apply)?

- ☐ Yes: Please provide cost estimate: $ _____ or provide range: _____
  per thousand square feet of production on a _____ basis.
- ☐ No

Please describe the costs incurred:

☐ m. OPTIONAL. Please use the space below to clarify or further explain any of your responses to Question 18.

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V. Planned Changes to Achieve CARB Phase 2 Certification

Please complete Questions 22 through 24 if you:

1. Anticipate making changes to your production process or raw materials for the purpose of achieving CARB Phase 2 certification, or
2. If you have already achieved Phase 2 certification but you anticipate making additional changes to production processes or raw materials for the purpose of optimizing the production processes for your CARB Phase 2 compliant products, or
3. If you have already achieved CARB Phase 2 certification but you anticipate making additional changes to production processes or raw materials for the purpose of achieving CARB Phase 2 ULEF or NAF certification.

If you will need to address different issues to achieve CARB Phase 2 certification for different products in a pressed wood category (for example, MDF and thin MDF, or products made with UF resin and products made with MF resin), please complete a separate copy of Section V for *each* group of products where similar issues will need to be addressed. You may choose to complete a separate copy of Section V for each adhesive/emissions class, complete a separate copy of Section V for a *group* of adhesive/emissions classes, or simply complete a separate copy of Section V for *an entire* pressed wood category.

If you are not sure which changes you will make to achieve CARB Phase 2 certification because you are still considering more than one possible approach (e.g., both enhanced UF resins and soy-based resins), please use the approach you consider most likely as the basis for your responses in Section V.

Adhesive/emissions class means a class of pressed wood products that differs from others based on binder/resin technology, formaldehyde emission certification standard category, and/or formaldehyde emission profile.

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22. Planned changes (through 2012) to the production processes or raw materials.
Check all boxes that apply and fill in the applicable blanks.

☐ a. Specify product for which there are planned changes (through 2012) to the production processes or raw materials used in order to achieve CARB Phase 2 certification, optimize your process, or achieve ULEF or NAF certification, using the Pressed Wood Categories from Question 9:

Primary Pressed Wood Category: _____

Adhesive/Emissions Class (if applicable): _____

Check red box if response is confidential business information (CBI)

22. (cont.) Planned changes (through 2012) to the production processes or raw materials.

☐ b. What are the planned changes and changes that may be considered to the resin system or production process? Please check all appropriate boxes. (check N/A if not applicable)

Lower ratio of formaldehyde to other resin component(s) (e.g., urea, melamine, phenol, etc.)	☐ planned	☐ may consider	☐ will not change	☐ N/A
please specify non-formaldehyde resin component: _____				
Addition of or changes to catalysts in resins	☐ planned	☐ may consider	☐ will not change	☐ N/A
Addition of or changes to scavengers in resins	☐ planned	☐ may consider	☐ will not change	☐ N/A
Addition of or changes to other additives	☐ planned	☐ may consider	☐ will not change	☐ N/A
Post-press treatment of panels	☐ planned	☐ may consider	☐ will not change	☐ N/A
New resin system	☐ planned	☐ may consider	☐ will not change	☐ N/A
Changes to application equipment	☐ planned	☐ may consider	☐ will not change	☐ N/A
Changes to blending equipment	☐ planned	☐ may consider	☐ will not change	☐ N/A
Changes to process controls	☐ planned	☐ may consider	☐ will not change	☐ N/A
Changes to pressing or drying times	☐ planned	☐ may consider	☐ will not change	☐ N/A
Changes to pressing or drying temperatures	☐ planned	☐ may consider	☐ will not change	☐ N/A
Other	☐ planned	☐ may consider	☐ will not change	☐ N/A
please specify what will change: _____				

☐ c. How firm are the planned changes for this pressed wood category and adhesive/emissions class?

☐ Very Likely ☐ Somewhat Likely ☐ Somewhat Uncertain ☐ Very Uncertain

☐ d. OPTIONAL. Please use the space below to clarify or further explain any of your responses to Question 22.

Check red box if response is confidential business information (CBI)

23. Issues your plant is expected to address in order to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process.

☐ a. ☐ Your plant will need to address issues associated with sticking or buildup on press platens.

☐ b. ☐ Your plant will need to improve resin unloading, storage and handling system to deal with higher liquid viscosity, handle dry materials, and/or blend multiple components.

☐ c. ☐ Your plant will need to upgrade blending or application equipment.

Please describe the expected equipment change. For instance, "*Install two new metering pumps and flow meters to control ratios of resin components to a new inline mixer. Install new programmable automation controllers on the blender and resin metering pumps and integrated into the mill's visualization platform.*"

☐ d. ☐ Your plant will need to address issues associated with resin tack, including:

- ☐ Build-up in conveyers, bins, or mat formers
- ☐ Mat integrity problems
- ☐ Prepress tack

☐ e. ☐ Your plant will need to upgrade your press.

For the press that will be upgraded, please describe what will be done. For instance, "*Convert the press from steam heat to thermal oil in order to achieve higher platen temperature and improve productivity with PF resin.*"

☐ f. ☐ Your plant will need to address issues associated with not having enough cooling capacity to deal with master panels.

☐ g. ☐ Your plant will need to address issues associated with out-of-press moisture content due to longer or hotter press times.

☐ h. ☐ Industrial hygiene concerns (e.g., worker health) will influence your ability to use certain resin types.

☐ i. ☐ Your plant will need to resolve issues associated with waste control.

Please explain:

Check red box if response is confidential business information (CBI)

23. (cont.) Issues your plant is expected to address in order to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process.

j. ☐ Your plant will need to address issues associated with limited excess drying capacity.

k. ☐ Your plant will need to modify your board coolers.

l. ☐ Your plant will need to add new wood burners to burn residuals that were previously recycled.

m. OPTIONAL. Please use the space below to describe other issues your plant is expected to address or to clarify or further explain any of your responses to Question 23.

24. Estimated costs of planned changes to the production processes or raw materials.
If you are uncertain about what future costs are likely to be, please provide your best estimate if possible. You may use the space provided in Question 24.l to describe uncertainties.

a. Does your plant expect to incur research and development costs directly related to changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process?

☐ Yes: Please provide cost estimate: $ _____ or choose range:

☐ No

b. Does your plant expect to incur capital improvement costs directly related to changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process? (check all that apply)

☐ Yes, capital expenditures for modifying existing equipment

☐ Yes, capital expenditures for new equipment

☐ No

Please provide a cost estimate for all capital improvements costs directly related to changes made to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process:

Enter estimate: $ _____ or choose a range:

c. Does your plant expect to incur any other start-up or one-time costs directly related to changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process?

☐ Yes: Please provide cost estimate: $ _____ or choose range:

☐ No

Please describe the expected costs:

Check red box if response is confidential business information (CBI)

24. (cont.) Estimated costs of planned changes to the production processes or raw materials.

☐ d. Does your plant expect any of the following material costs to change directly as a result of changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process (check appropriate boxes)?

Resin prices expected to:	☐ increase	☐ decrease	☐ remain unchanged
Resin usage expected to:	☐ increase	☐ decrease	☐ remain unchanged
Additive costs expected to:	☐ increase	☐ decrease	☐ remain unchanged
Post-press treatment costs expected to:	☐ increase	☐ decrease	☐ remain unchanged
Other material costs expected to:	☐ increase	☐ decrease	☐ remain unchanged

please specify: _____

Please provide a cost estimate for all material costs directly related to changes made to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

Overall, this is an expected cost: ☐ increase ☐ decrease

☐ e. Are any of the following operating costs expected to change directly as a result of changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process (check appropriate boxes)?

Labor costs expected to:	☐ increase	☐ decrease	☐ remain unchanged
Energy costs expected to:	☐ increase	☐ decrease	☐ remain unchanged
Other operating costs expected to:	☐ increase	☐ decrease	☐ remain unchanged

please specify: _____

Please provide a cost estimate for all operating costs directly related to changes made to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

Overall, this is an expected cost: ☐ increase ☐ decrease

☐ f. Are any of the following recordkeeping, testing, or certification costs expected to change as a result of changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process (check appropriate boxes)?

Recordkeeping costs expected to:	☐ increase	☐ decrease	☐ remain unchanged
Testing & certification costs expected to:	☐ increase	☐ decrease	☐ remain unchanged

Please provide a cost estimate of recordkeeping, testing, and certification costs directly related to changes made to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process:

Enter estimate for initial costs: $ _____ or choose a range: ☐

Enter estimate for annual recurring costs: $ _____ or choose a range: ☐

Overall, this is an expected cost: ☐ increase ☐ decrease

Check red box if response is confidential business information (CBI)

24. (cont.) Estimated costs of planned changes to the production processes or raw materials.

☐ g. Are product reject rates expected to change directly as a result of changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process? If so, how much are the reject rates expected to increase or decrease?
(Please indicate change in reject rate, not the overall rate)

- ☐ Yes, higher - expected to increase: ☐ less than 5% ☐ 5% to 10% ☐ more than 10%
- ☐ Yes, lower - expected to decrease: ☐ less than 5% ☐ 5% to 10% ☐ more than 10%
- ☐ No, reject rates are not expected to change as a result of changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process.

Please provide an estimate of how much your costs would change directly as a result of the change in reject rate per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

☐ h. Please indicate the percentage of production expected to be rejected for exceeding the Phase 2 emission levels: _____ %

Please indicate what you expect to do with panels rejected for exceeding the Phase 2 emission levels:

_____% Sell for domestic use outside of California
_____% Export
_____% Burn for energy generation
_____% Reuse as raw material
_____% Use or dispose of in some other way. Please describe:

_____

☐ i. Does your plant expect to experience an initial period of adjustment, where efficiency will be low, as it makes changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process? For example, this may include test production runs.

- ☐ Yes, adjustment period is expected please specify approximate duration: _____
- ☐ No, no significant adjustment period is expected

Please provide an estimate of how much your costs would change directly as a result of the initial adjustment period per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

☐ j. Is your plant's productivity, in terms of production per hour, expected to change directly as a result of changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process?

- ☐ Yes, productivity is expected to increase. Please specify approximate percentage change: _____
- ☐ Yes, productivity is expected to decrease. Please specify approximate percentage change: _____
- ☐ No, productivity is not expected to change as a result of changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process.

Please provide an estimate of how much your costs would change directly as a result of the change in productivity per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

Check red box if response is confidential business information (CBI)

24. (cont.) Estimated costs of planned changes to the production processes or raw materials.

☐ k. Is your plant's amount of downtime (i.e. periods of time during which production is stopped) expected to change directly as a result of changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process?

- ☐ Yes, downtime is expected to increase. Please specify expected change: _____
- ☐ Yes, downtime is expected to decrease. Please specify expected change: _____
- ☐ No, downtime is not expected to change as a result of changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process.

Please provide an estimate of how much your costs would change directly as a result of the change in downtime per thousand square feet of production on a _____ basis:

Enter estimate: $ _____ or provide a range: _____

☐ l. Does your plant expect to incur any other recurring costs directly as a result of changes to achieve CARB Phase 2 certification, ULEF or NAF certification, or optimize your production process?

- ☐ Yes: Please provide cost estimate: $ _____ or provide range: _____
- ☐ No per thousand square feet of production on a _____ basis.

Please describe the expected costs:

☐ m. OPTIONAL. Please use the space below to clarify or further explain any of your responses to Question 24.

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VI. Issues That May Affect Ability to Reduce Formaldehyde Emissions for Respondents Who Do Not Intend to Become CARB Phase 2 Certified

If you manufacture a product that you do not have certified under CARB Phase 2, because your product qualifies for an exemption under the CARB ATCM (it will be sold and used outside of California, or used in manufactured homes subject to HUD regulations) or because it does not meet the CARB ATCM definitions of hardwood plywood, medium density fiberboard, or particleboard, please complete Question 25.

If you would need to address different issues to achieve CARB Phase 2 certification for different products in a pressed wood category (for example, MDF and thin MDF, or products made with UF resin and products made with MF resin), please complete a separate copy of Question 25 for each group of products where similar issues would need to be addressed. You may choose to complete a separate copy of Question 25 for *each* adhesive/emissions class, complete a separate copy of Question 25 for a *group* of adhesive/emissions classes, or simply complete a separate copy of Question 25 for *an entire* pressed wood category.

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25. Issues your plant would need to address in order to adopt a lower emission technology to meet CARB Phase 2 formaldehyde emission levels.

☐ a. Please specify the Primary Pressed Wood Category, using the Pressed Wood Categories from Question 9:

_____

☐ b. Please explain why you do not intend to become CARB Phase 2 certified:

☐ c. What is the most likely resin/binder you would use if you were to become CARB Phase 2 certified?

_____

☐ d. ☐ Your plant would need to address issues associated with sticking or buildup on press platens.

☐ e. ☐ Your plant would need to improve resin unloading, storage and handling system to deal with higher liquid viscosity, handle dry materials, and/or blend multiple components.

☐ f. ☐ Your plant would need to upgrade blending or application equipment.

Please describe the equipment changes expected to be necessary. For instance, "*Install two new metering pumps and flow meters to control ratios of resin components to a new inline mixer. Install new programmable automation controllers on the blender and resin metering pumps and integrated into the mill's visualization platform.*"

Check red box if response is confidential business information (CBI)

25. (cont.) Issues your plant would need to address in order to adopt a lower emission technology to meet CARB Phase 2 formaldehyde emission levels.

g. ☐ Your plant would need to address issues associated with resin tack, including:

- ☐ Build-up in conveyers, bins, or mat formers
- ☐ Mat integrity problems
- ☐ Prepress tack

h. ☐ Your plant would need to upgrade your press.

For the press that would need to be upgraded, please describe what would be done. For instance, "*Convert the press from steam heat to thermal oil in order to achieve higher platen temperature with PF resin.*"

i. ☐ Your plant's press is a bottleneck (no excess press capacity), so you would have to address or accept lower productivity because of slower curing resins.

j. ☐ Your plant would have to address or accept lower productivity because of other reasons.

Please explain:

k. ☐ Your plant would need to resolve issues associated with not having enough cooling capacity to deal with master panels.

l. ☐ Your plant would need to resolve issues associated with out-of-press moisture content due to longer or hotter press times.

m. ☐ Industrial hygiene concerns (e.g., worker health) would influence your ability to use certain resin types.

n. ☐ Your plant would need to resolve issues associated with waste control.

Please explain:

Check red box if response is confidential business information (CBI)

25. (cont.) Issues your plant would need to address in order to adopt a lower emission technology to meet CARB Phase 2 formaldehyde emission levels.

☐ o. ☐ Your plant would need to address issues associated with limited excess drying capacity.

☐ p. ☐ Your plant would need to modify your board coolers.

☐ q. ☐ Your plant would need to add new wood burners to burn residuals that were previously recycled.

☐ r. OPTIONAL. Please use the space below to describe other issues your plant would need to address or to clarify or further explain any of your responses to Question 25.

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VII. Issues That May Affect Ability to Use a No-Added Formaldehyde (NAF) Resin

Please complete a separate copy of Question 26 for each primary pressed wood category manufactured at your plant, with the following exceptions:

1. The pressed wood category has no added formaldehyde, or
2. The pressed wood category will have no added formaldehyde after making the planned changes to the production process or raw materials reported in Questions 22 - 24.

If you would need to address different issues to use a NAF resin for different products in a pressed wood category (for example, MDF and thin MDF, or products made with UF resin and products made with MF resin), please complete a separate copy of Question 26 for each group of products where similar issues would need to be addressed. You may choose to complete a separate copy of Question 26 for *each* adhesive/emissions class, complete a separate copy of Question 26 for a *group* of adhesive/emissions classes, or simply complete a separate copy of Question 26 for *an entire* pressed wood category.

Click the button below to have the electronic version of this form automatically generate an additional copy of Section VII. If you are using the paper version of this form, please use the extra copies provided and make additional copies as necessary.

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26. Issues your plant would need to address in order to use a no-added formaldehyde (NAF) resin technology.

☐ a. Please specify the Primary Pressed Wood Category, using the Pressed Wood Categories from Question 9:

_____

☐ b. ☐ Your plant would need to address issues associated with sticking or buildup on press platens.

☐ c. ☐ Your plant would need to improve resin unloading, storage and handling system to deal with higher liquid viscosity, handle dry materials, and/or blend multiple components.

☐ d. ☐ Your plant would need to upgrade blending or application equipment.

Please describe the equipment changes expected to be necessary. For instance, "*Install two new metering pumps and flow meters to control ratios of resin components to a new inline mixer. Install new programmable automation controllers on the blender and resin metering pumps and integrated into the mill's visualization platform.*"

☐ e. ☐ Your plant would need to resolve issues associated with resin tack, including:

- ☐ Build-up in conveyers, bins, or mat formers
- ☐ Mat integrity problems
- ☐ Prepress tack

Check red box if response is confidential business information (CBI)

26. (cont.) Issues your plant would need to address in order to adopt a no-added formaldehyde (NAF) resin technology.

f. ☐ Your plant would need to upgrade your press.

For the press that would need to be upgraded, please describe what would be done.

g. ☐ Your plant's press is a bottleneck (no excess press capacity), so you would have to address or accept lower productivity because of slower curing resins.

h. ☐ Your plant would have to address or accept lower productivity because of other reasons.

Please explain:

i. ☐ Your plant would need to resolve issues associated with not having enough cooling capacity to deal with master panels.

j. ☐ Your plant would need to resolve issues associated with out-of-press moisture content due to longer or hotter press times.

k. ☐ Industrial hygiene concerns (e.g., worker health) would influence your ability to use certain resin types.

l. ☐ Your plant would need to resolve issues associated with waste control.

Please explain:

m. ☐ Your plant would need to address issues associated with limited excess drying capacity.

n. ☐ Your plant would need to modify your board coolers.

o. ☐ Your plant would need to add new wood burners to burn residuals that were previously recycled.

p. OPTIONAL. Please use the space below to describe other issues your plant would need to address or to clarify or further explain any of your responses to Question 26.

VIII. Secondary Products Manufactured

27. Resins and Binders for Secondary Pressed Wood Products Manufactured.

If you use different resins or binders for different products within a secondary pressed wood product category, number each product separately. If you use more than one resin or binder for a single product, separate each resin/ binder with a comma. For example, if you manufacture two types of vinyl laminates, one product with a UF resin and another product with a PVA resin, you should report "(1) UF, (2) PVA" in column 3. If you manufacture a low pressure decorative laminate that uses a blend of UF and MF resins you should report "UF,MF" in column 3. Similarly, if one product is made with particleboard and a second is made with medium density fiberboard, you should report: "(1) PB, (2) MDF" in column 4 (see examples below).

**** Check red box if response is confidential business information (CBI)***

CBI*	Secondary Pressed Wood Product Category (Column 1)	Check if manufactured at your plant. (Column 2)	Please use the codes listed below to specify the resin/binder currently used in the secondary manufacturing process[1] (include resins in saturated paper) (Column 3)	Please use the codes listed below to specify the primary pressed wood product(s) used in this production [2] (Column 4)
	Example: Vinyl Laminate	☒	***Resin or Binder Used: (1) UF, (2) PVA***	***Primary Pressed Wood Product(s) Used: (1) PB, (2) MDF***
	Example: Low Pressure Decorative Laminates (LPDL)	☒	***Resin or Binder Used: UF, MF***	***Primary Pressed Wood Product(s) Used: PB***
☐	a. Filled or Coated Products	☐	Resin or Binder Used:	Primary Pressed Wood Product(s) Used:
☐	b. High Pressure Laminates (HPL)	☐	Resin or Binder Used:	Primary Pressed Wood Product(s) Used:
☐	c. Hot Stamp Foils	☐	Resin or Binder Used:	Primary Pressed Wood Product(s) Used:
☐	d. Low Basis Weight Papers (LBWP)	☐	Resin or Binder Used:	Primary Pressed Wood Product(s) Used:
☐	e. Low Pressure Decorative Laminates (LPDL)	☐	Resin or Binder Used:	Primary Pressed Wood Product(s) Used:
☐	f. Medium and High Density Overlays (MDO and HDO)	☐	Resin or Binder Used:	Primary Pressed Wood Product(s) Used:
☐	g. Vinyl Laminate	☐	Resin or Binder Used:	Primary Pressed Wood Product(s) Used:
☐	h. Other. Please specify:	☐	Resin or Binder Used:	Primary Pressed Wood Product(s) Used:

1. Binder/Resin Categories:

CNSL	Cashew Nut Shell Liquid
MF	Melamine-formaldehyde
MUF	Melamine-urea-formaldehyde
MDI	Methlylene Diisocyanate
pMDI	Polymeric Diphenylmethane Diisocyanate
PF	Phenol-formaldehyde
PF-MDI	Phenol-formaldehyde-MDI
PMUF-MDI	Phenol-melamine-urea-formaldehyde-MDI
PUF-MDI	Phenol-urea-formaldehyde-MDI
PUFT	Phenol-urea-formaldehyde-Tannin
PVA	Polyvinyl Acetate
SBR	Soy-based resins
TBR	Tannin-based resins
UF	Urea-formaldehyde
O	Other: Please Describe
+s	addition of scavenger to resin (for example, "MF+s")
+c	addition of catalysts to resin
+a	addition of other additives to resin

2. Primary Pressed Wood Categories:

GLB	Glulam beams
HB	Hardboard
HWPW	Hardwood Plywood
LVL	Laminated Veneer Lumber
MDF	Medium Density Fiberboard
OSL	Oriented Strand Lumber
OSB	Oriented Strandboard
PB	Particleboard
SWPW	Softwood Plywood

THE END

Thank you. Please see the sheet labeled *Instructions for Returning the Completed Questionnaire to EPA* for directions on how to return this questionnaire to EPA.