

California Environmental Protection Agency



**Standard Operating Procedure for
Composite Wood Panel Test Specimen Preparation
Prior to Analysis of Formaldehyde Emissions from
Composite Wood Products**

**Consumer Products Enforcement Section
Vehicle, Parts, and Consumer Products Enforcement Branch
Enforcement Division**

9/13/2013

DISCLAIMER: Mention of any trade name or commercial product in this Standard Operating Procedure does not constitute endorsement or recommendation of this product by the Air Resources Board. Specific brand names and instrument descriptions listed in the Standard Operating Procedures are equipment used by the ARB. Any functionally equivalent instrumentation can be used.

1. SCOPE

This Standard Operating Procedure (SOP) describes an acceptable procedure for acquiring composite wood panels and preparing specimens from those panels prior to laboratory testing according to the requirements of ARB's Monitoring and Laboratory Division SOP "Sampling and Analysis of Formaldehyde Emissions from Composite Wood Products." The primary goals of this SOP are preparing samples using consistent procedures and preserving the integrity of the samples.

2. SUMMARY OF METHOD

Acquisition: A composite wood panel can be acquired in a number of ways including purchase or donation from a panel retailer, distributor, importer, or manufacturer or from a fabricator of finished goods. Select a panel from a stack of like panels, avoiding the top and bottom panels. Panels can be cut for ease of handling and transportation.

Storage: Each panel shall be stacked on a sheet of 6-mil polyethylene plastic and covered with a sheet of 6-mil plastic to prevent contamination. The edges are not required to be sealed because the edges are discarded during sample preparation. Each panel is assigned an identification number. Panels and samples must be stored in a locked area with restricted access.

Sample specimen preparation: Nine specimens are required from each panel. One specimen is cut from each of nine equal sections of the panel (think tic-tac-toe). Specimen size is determined by the laboratory to meet the air flow and surface area requirements as defined in the ASTM D6007. Specimen size can vary among laboratories due to differences in equipment, air flow rates, etc. Cut and labeled specimens are stored in resealable bags made of 6-mil plastic or equivalent.

Panels may be selected for any number of reasons including random selection, shortage of test data for a manufacturer or importer, tip, complaint, or screening by a portable formaldehyde analyzer.

3. INTERFERENCES/LIMITATIONS

Cross contamination between a high emitting panel and a low emitting panel is a concern if the panels are stacked without separation. Unless from a common unit, stacked panels must be separated by 6-mil plastic sheeting during transportation and storage.

Emissions decay, or the loss of formaldehyde from an exposed panel to the atmosphere, will cause lower formaldehyde emission results than an otherwise fresh

panel. When selecting a panel for testing, avoid the top and bottom panels in a stack. Heat can increase emissions decay so storage in hot areas should be avoided when practical.

Exposure of the edges is unavoidable and ongoing in an industrial or retail setting. When cutting sample specimens, avoid the area within 2 inches of any edge exposed during transportation or storage.

4. EQUIPMENT AND CONDITIONS

A. MATERIALS

Plastic sheeting (as sold for painting or landscaping), thickness = 6 mils
Tape, 3M blue masking tape
Pencils, #2
Formaldehyde free permanent markers
Sample Bags, Resealable made of 6-mil plastic

B. EQUIPMENT

Panel Saw
Table Saw
Band Saw
Jig Saw
Circular Saw

5. ACQUISITION OF PANELS

The panel can be acquired in a number of ways including purchase or donation from a panel retailer, distributor, importer, or manufacturer or from a fabricator of finished goods.

Select a panel from a stack of like panels. Avoid the top and bottom panels if possible.

Panels can be cut for ease of handling and transportation. Before cutting, mark each panel with a pencil in such a way that the original orientation of the cut boards can be restored prior to cutting sample specimens.

Each panel is assigned an identification number and labeled using a pencil or formaldehyde free permanent marker. The identification number consists of the

date in the form yymmdd, two letters (normally inspector initials), and two digits to differentiate samples collected on a given day. An example could be 110704FJ02. This data is included in a chain of custody that accompanies the sample and is updated as necessary.

Each panel type from a common unit shall be stacked on a sheet of 6-mil plastic (as a whole panel or cut into segments) and covered with a sheet of 6-mil plastic. The edges are not required to be sealed because the edges are discarded during sample preparation.

ASTM Method D6007 allows for alternative ways of collecting samples. "When testing wood products that are not newly manufactured such as after original application, installation or use, the method of packaging and shipping the products shall be fully described. Information on the age and history of the product shall be detailed in the test report."

6. PREPARATION OF SAMPLES

- A. Sample Layout: Nine specimens are required from each panel. One specimen is cut from each of nine equal sections of the panel. The nine equal sections are defined by dividing the panel into thirds both lengthwise and widthwise. A specimen can be cut from anywhere within the section with the exception of the area within 2 inches of the outer edge of the original panel.
- B. Specimen Size: Test specimen dimensions are determined by the laboratory to meet the air flow and surface area requirements as defined in the ASTM D6007. Sample size can vary among laboratories due to differences in equipment, air flow rates, etc.
 1. For the CARB MLD laboratory, the following sample surface areas are specified:
 - i. MDF, 49 square inches
 - ii. Particle board, 78.75 square inches
 - iii. Hardwood plywood, 78.75 square inches
 - iv. Hardwood plywood wall paneling, 174 square inches

These surface areas can be achieved by testing one specimen with both sides exposed and the edges taped. Alternatively, two specimens can be cut and arranged face-to-face or back-to-back with edges taped to achieve the same surface area. ASTM D6007 allows this for nonstandard testing of products with a single surface exposed. This is often done if one side of the panel has a surface coating.

2. ARB's formaldehyde requires that the nine specimens representing a panel are to be tested in groups of three specimens, resulting in three test results, which are averaged to represent the emissions for the entire panel. To achieve these required surface areas, ARB specimens are normally cut to the following dimensions:
 - i. MDF, 2.33 inches by 3.5 inches
 - ii. Particle board, 2.33 inches by 5 5/8 inches
 - iii. Hardwood plywood, 2.33 inches by 5 5/8 inches
 - iv. Hardwood plywood wall paneling, 2.33 inches by 12 3/8 inches

C. Specimen Handling:

1. Cut and labeled specimens are placed in resealable bags made of 6-mil plastic or equivalent. Specimens are labeled with pencil with the specimen number showing through the bag.
2. Record specimen identification numbers, descriptions, and preparation details along with the date in the wood shop log book.
3. Update chain of custody form to accompany specimens to ARB laboratory.