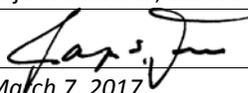


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Product Sample Formaldehyde Emissions

Customer & Building Product Sample Information

Report Certification	
Report number	579-008-02A-Mar0717
Report date	Mar 7, 2017
Certified by (Name/Title)	Raja S. Tannous, Laboratory Director
Signature	
Date	March 7, 2017

Standards	
Test method	ASTM D6007
Analytical method	ASTM D5197
Preparation/Configuration	None, back-to-back configuration.

Customer Information	
Manufacturer or organization	Hallmark Floors
City/State/Country	Ontario, CA USA
Contact name/Title	Rudy Sambrano
Phone number	909-947-7736

Product Sample Information	
Manufacturer (if not customer)	Same as above
Product name / Number	Novella / NO6FITO
Lot Number	0813054
Product category	Prefinished Paneling (06 25 00)
Core type	HWPW
Manufacturing location or mill	not provided
Date sample manufactured	Jul 1, 2016
Date sample collected	not provided
Sample selected & collected by	Customer
Date sample received by lab	Feb 22, 2017
Sample shipped / stored in	Original package
Condition of received sample	OK
Lab sample tracking number	579-008-02A
Conditioning start date & duration	Feb 23, 2017; 7 days (168 hours)
Test start date & duration	Mar 2, 2017; 1 days (18 hours)

Formaldehyde Concentration Test Result

Test Results – The measured formaldehyde chamber concentration and the concentration adjusted to standard conditions of 25 °C and 50% relative humidity are presented in Table 1.

Table 1. Test results. Measured and standardized formaldehyde concentration (ppm)

Compound	Elapsed Time (h)	Chamber Concentration ($\mu\text{g}/\text{m}^3$)	Chamber Concentration (ppm)	Standardized Concentration (ppm)	Meets CARB Phase 2 Standard?*
Formaldehyde	18	5.0	0.004	0.004	Yes

*CARB Phase 2 standard for corresponding composite wood core material (Table 2)

CARB Phase 2 – The California Air Resources Board (CARB) Phase 2 formaldehyde emission standards are published in Final Regulation Order, Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products, Section 93120.2 Table 1, Title 17, California Code of Regulations. The emission standards are standardized chamber concentrations for composite wood core materials measured by primary method ASTM Standard Method E-1333. Secondary test method ASTM Standard Method D6007 has been shown to produce equivalent results. CARB Phase 2 formaldehyde emission standards are reproduced in Table 2.

Table 2. CARB Phase 2 Formaldehyde Emission Standards in parts-per-million (ppm)

Composite Wood Core Material	Phase 2 Effective Date	Specified Q/A Test Ratio (m/h)	Phase 2 Emission Standard (ppm)
Hardwood plywood (HWPW)	7/1/2012	1.173	≤ 0.05
Particleboard (PB)	1/1/2011	1.173	≤ 0.09
Medium Density Fiberboard (MDF)	1/1/2011	1.905	≤ 0.11
Thin MDF <8mm thick	1/1/2012	1.905	≤ 0.13

Test Standards & Procedures

Test Protocol Summary* – Formaldehyde emission testing is performed following ASTM Standard Method D6007. As employed herein, ASTM D6007 is a quality control test as defined by CARB. Particleboard and hardwood plywood panels (veneer core and composite core) are tested with an area-specific airflow rate (Q/A) = 1.173 m/h. MDF/HDF and thin MDF (<8mm thick) are tested with Q/A = 1.905 m/h. The specimen is placed directly into the conditioning environment and maintained at specified temperature and relative humidity (RH) conditions for the specified period. Conditioning formaldehyde concentration is ≤ 0.1 ppm. At the end of this period, the specimen is transferred to a small-scale chamber. Chamber parameters for the test are shown in Table 3.

Sampling and analysis for formaldehyde are performed following ASTM Standard Method D5197. Sample is collected at end of test period at 0.6 L/m for 60 min. The test result is determined as chamber formaldehyde concentration in parts-per-million (ppm) as shown in Calculation and Comments section. Measured chamber concentration is corrected to standard conditions of 25 °C and 50% RH. Chamber background formaldehyde concentration is ≤ 0.002 ppm unless otherwise noted.

*All standards identified in this section are included in Berkeley Analytical’s scope of ISO/IEC17025 accreditation, Testing Laboratory TL-383, International Accreditation Service, www.iasonline.org

Test Standards & Procedures, Continued

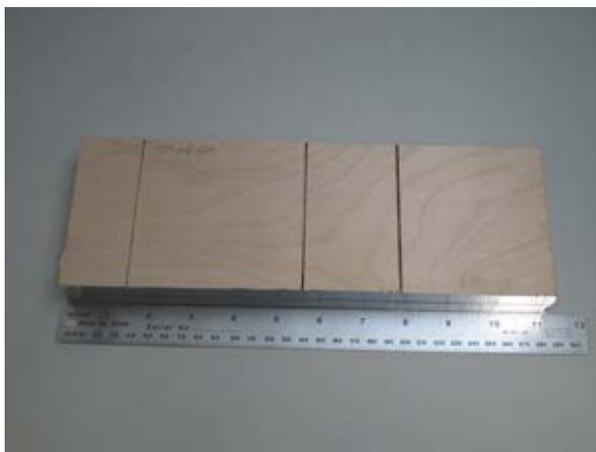
- 1) **Test Specimen Preparation** – Product sample was tested as received. Two pieces of specimen were cut to size from sample. Pieces were stacked together in back-to-back configuration. Aluminum tape was used to seal edges, leaving two wood surfaces exposed for testing. Test results are specific to the test item..

Table 3. Chamber conditions for test

Parameter	Symbol	Units	Value
Tested specimen exposed area	A_s	m^2	0.057
Chamber volume	V_c	m^3	0.067
Inlet gas flow rate	Q_c	m^3/h	0.067 (0.064-0.070)
Area-specific airflow rate	Q_c/A_s	m/h	1.17
Temperature		$^{\circ}C$	25.4
Relative humidity		%	50
Test period duration		h	18

Photographs of Tested Product Specimen

Photo Documentation – The product sample specimen is photographed following specimen preparation. The top and bottom faces of the specimen are photographed.



Calcalaton and Comments

Equation Used in Calculation – Chamber concentration is converted from $\mu\text{g}/\text{m}^3$ to ppm, using Equation 1:

$$C = (M \times 24.47) / (V \times 30.03) / 1000 \quad (1)$$

where:

C = Formaldehyde parts-per-million in air, ppm,

M = Mass of formaldehyde in sample, μg ,

V = Volume of air sample at standard conditions (25 °C, 101 kPa), L,

30.03 = Molecular weight of formaldehyde,

24.47 = μL of formaldehyde gas in 1 μmol at 25 °C, 101 kPa, and

1000 = Conversion factor.

Calculated formaldehyde concentration is rounded to nearest 0.01 ppm. Measured concentration is adjusted to standard conditions of 25 °C and 50% RH using conversion factors in ASTM Standard Method D6007, Annex Tables A1.1 and A2.1, respectively.

Comments: None

END OF REPORT

Ship to: 815 Harbour Way South, No. 6 Richmond, CA 94804
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 info@berkeleyanalytical.com

Customer Information

Company: Hallmark Floors
 Street Address: 2360 S. Archibald Ave.
 City/State/Zip(postal code): Ontario, CA 91761
 Country: USA
 Contact Name & Title (for reporting): Rudy Sambrano
 Contact Phone/Fax Numbers: 909-947-7734 / 909-947-7776
 Contact E-mail Address: rudys@hallmarkfloors.com
 Financially Responsible Co.: Hallmark Floors

Manufacturer (if different from customer)

Company: same as above
 City/State/Country:
 Contact Name/Title:
 Phone Number/E-mail Address:

Sample Details

Product Commercial Name*: Novella
 Product Commercial Part No.: NO6FITO
 Manufacturer Lot / Batch No. *: 0813054
 Date Manufactured *: July 2016
 Product Category & Use *: Prefinished engineered hardwood flooring
 Sample Construction Material *: wood
 Plant Name & Location *:
 Collection Location within Plant :
 Date & Time Collected* :
 Number of Sample Pieces *: 2 Photo(s) of Collection Location: Yes
 Sample Collected by *: Rudy Sambrano
 Phone/Fax Numbers*: 909-947-7736 / 909-947-7776
 E-mail Address*: rudys@hallmarkfloors.com

Shipping Details

Packed & Shipped By: Rudy Sambrano
 Shipping Date : Feb. 15, 2017
 Carrier/Airbill Number : Shipped UPS 1Zx3191V0374489852

Sample Handling

Relinquished By	Received By*	Signature	Date	Company
	ALICE HUANG	Alice Huang	2-22-17	BKA

Chain of Custody for ASTM D6007 Emission Test

A Separate COC must be completed for EACH product/material sample
 A link to Berkeley Analytical's Terms & Conditions is included in this workbook. By submitting samples, customer acknowledges and accepts these terms & conditions unless a prior written contract is in effect.

Berkeley Analytical Quotation Number:
 Purchase Order (enter company & number):
Requested Test
 Test Method to be performed: ASTM D6007
 Test results acceptance criterion: CARB ATCM Phase 2
 Test schedule: 7-day Conditioning, 20-hrs Test
 Shorter conditioning time request? 2-hr or other: Yes No If Yes total hrs:
 TPC Certification Test? 7-day Cond., 20-hrs Test: Yes No If Yes TPC #:

For Berkeley Analytical Use:

Report ID:
 Billing Reference:
Customer Instructions for Sample Prep., Test Type, schedule, etc.
 Small-scale, composite wood Formaldehyde emission screening test or TPC Certification test by ASTM D6007 with sampling and analysis by ASTM D5197. Deconstruction of finished product following CARB SOP if required. CARB Phase 2 acceptance criterion, 7 days conditioning unless shorter time is specified followed by chamber test with sampling for formaldehyde in 16 to 20 hours interval.

Customer Request for Laboratory Certificate of Compliance

Indicate if you are ordering a Laboratory Certificate of Compliance: Not Applicable
 Berkeley Analytical's laboratory test results are specific to the tested item. Claims made by the customer regarding the broader representativeness of the test results are the sole responsibility of the customer.

Customer Authorizes Laboratory to Submit Copies of Test Report to:

Contact/E-mail Address:
 Organization:
 Contact/E-mail Address:
 Organization:

For Berkeley Analytical Use Only

Condition of Shipping Package: OK
 Condition of Sample: OK
 Lab Tracking Number: 579-008-02A